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MEDICINE AND THE MEDICAL AGE

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THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE.

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ORIGINAL COMMUNICATIONS.

A CLINICAL CONSIDERATION OF THE ETIOLOGICAL IMPORTANCE OF FAT IN THE ALIMENTARY DISTURBANCES OF THE ARTIFICIALLY FED AND OF THE THERAPEUTIC VALUE OF FAT-FREE FOODS, NOTABLY SKIM MILK.

BY HARRY LOWENBURG, A.M., M.D., PHILADELPHIA,

Pediatrist to the Mt. Sinai Hospital and to the Jewish Hospital of Philadelphia.

In looking over the records of feeding cases which have been under my private care, I was impressed by the large number of infants which I have placed upon fat-free or theoretically fat-free foods, or foods which were admittedly administered primarily on account of their low fat content. Of the first, skim milk was the most frequently prescribed. Of the second, buttermilk or protein milk or some one of its substitutes was employed. It is of some importance to note that nearly all of these cases were referred to me for treatment by fellow practitioners, or came under my care as the result of unsuccessful feeding, either lay or professional. Although differing somewhat in the detail of application in the individual infant, it was found that the cases included in this résumé all yielded to a method of treatment apparently uniform in its fundamental idea, viz., a reduction in fat. The logical conclusion to be drawn from this experience is that the identical etiological factor underlying all of these cases is excessive fat feeding (relative, meaning excessive for the individual and not estimated by actual percentage composition or caloric yield), and that the inexperienced feeder commonly falls into the error of ordering too much fat.

It will be noted that the expression "inexperienced feeder" is employed instead of "unscientific feeder." The latter is to be avoided inasmuch as its opposite, "scientific feeder," conjures in the mind of the practitioner an algebraic and mathematical expert whose preoccupation consists in feeding to infants impossible percentages and calories to the exclusion of ounces of milk and water, and whose conscious moments are devoted to high-brow and cynical criticism of his eminently successful but equally so-called "unscientific" but "experienced" brother practitioner. Unfortunately much of the so-called "scientific feeding" has been proven to be "unscientific" in principle and in application, and has been only so proven by experience. In this connection I wish here again to emphasize what I have stated and written many times before, that the key-note of successful infant feeding is individualization coupled with the ability to correctly interpret the appearance of stools and to apply this knowledge properly to the particular baby under consideration.

The ability and willingness to do this distinguish the scientific and experienced feeder from the unscientific and inexperienced one. The latter refers to the physician who does not study his cases clearly, who feeds by rule of thumb or by this one's or that one's method, who prescribes food in a manner in which he would not dare to administer drugs with equal carelessness, who oversteps all bounds of latitude for which admittedly the forces of nature provide, who then marvels at his

failures and in turn derides and blames those who combine common sense and brains in their relation to the problems of infantile digestion and nutrition.

The purpose of this paper, therefore, is not to offer a new precept in infant feeding, nor to elucidate a hitherto unknown fact, but to direct the attention of the general practitioner to an error that he is daily committing, and to remind him that he is able and competent to treat nearly all of his feeding cases himself if he will but study them with the same interest and enthusiasm with which he studies his cases of internal medicine. My topic is not for specialists, unless they are of those who still blindly will not see. My experience teaches me that, though this error has been pointed out years ago and many times since, it still requires emphasis and renewed attention.

Almost from the beginning of his career the eminent Jacobi has been teaching the dangers of excessive fat feeding, and for this reason opposed the introduction of the top-milk methods of milk modification, or, better stated, adaptation. In 1906, before the American Pediatric Society, Holt read a paper entitled "Some Phases of the Feeding Problem," in which he emphasized that it was unsafe to exceed 4 per cent of fat in any formula of cow's milk, and that for safety's sake it was best to feed much below this. A galaxy of pediatric authorities—Jacobi, Rotch, Morse, Abt, Cotton, Griffith, and others—discussed this paper. There was practically a unanimity of opinion amongst them all that digestive disturbances may frequently be laid at the door of excessive fat feeding and that it was rarely safe to exceed 4 per cent of fat. There was but one dissenting voice. It is important, however, to again stress the fact that the term "excessive" refers to the individual and is relative and not absolute. What is excessive for one may not be for another, and this is true not only of fats but for all the ingredients of the food, and in fact it is true of all types of food themselves.

More recently the investigations of Czerny (Berlin) have ascribed to excessive fat feeding an important place in the etiology of abnormal nutritional states of infancy and childhood. These have particular reference to the diarrheas of infancy and to pathologic states, representing frequently a symbiosis, as it were, of exudative and of infectious phenomena. While it is true that Czerny's views are opposed by those of Finkelstein in so far as they relate to the alimentary disturbances of infancy, and while the clinical application of many of his theories is not always followed by the results anticipated and desired, nevertheless his references are extremely valuable and enlightening.

Of more pregnant interest, perhaps, in so far as they have a direct bearing upon the clinical features of many of these cases, as will be indicated later, are the studies of Steinitz, Rothberg and Birk, which disclose the fact that the salts of the feces may be increased by increasing the fat in the food. (Quoted by Morse and Talbot in Diseases of Nutrition and Infant Feeding, page 54; MacMillan, 1915.)

I wish now to define the type of cases to which I have made reference. I am sure that the average physician will experience no difficulty in recognizing it. I shall address myself to the artificially reared, although the condition does, with considerable rarity however, occur in the breast-fed as well. For some one of the many reasons usually offered, a baby is removed from the breast. For a while it does well and gains regularly. Soon, however, the mother, as most mothers do, will complain that the infant is constipated. It may or may not be. She has exhausted the effects of local irritants (enemas, suppositories, etc.) and the commoner drugs, and she appeals to her medical adviser for assistance. It is here that the practitioner usually falls into the error which will presently be indicated, and which is responsible for the continued downward course of the baby. The constipation must be investigated and its full value established in the nosology of the

case. It is either real or it is not. If it be real, it is due to one of two primary factors: either to a digestive disturbance wherein the elements of the milk mixture are not suitably balanced to meet the digestive functions of the individual, or the sphincteric reflex has not yet become attuned to react automatically to the fecal mass as the latter reaches the lower rectum. This second condition is very common and sooner or later yields to educative efforts and to mild local assistance. The former is more common in the bottle-fed, and herein is taxed the physician's skill in determining the true condition by the physical appearance of the stool. If this be hard, inspissated, and dry, or if it be pasty and greasy, the cause will be found to be in the food. If the condition has persisted for some time, it will be noted that the nutritional balance has steadily though quietly suffered. The weight has remained stationary for weeks, or there is recorded an actual although slight loss. The child is fretful and appears hungry. The general appearance of the baby is suggestive. It is pale. Its flesh has lost tone and it appears flabby, especially about the inner aspect of the thighs. The skin appears transparent. Head sweating is induced by the mildest exercise and sometimes occurs spontaneously, as during sleep. The urine presents a decidedly ammoniacal odor. There may be slight beading of the ribs. In a word, as the case progresses, the signs of incipient rickets appear. A suitable adjustment of the food will correct these cases, the time of cure depending upon the time that the condition has persisted, although in many instances surprisingly quick results are obtained. Unfortunately, the physician rarely makes the suitable dietary adjustment, but falls into the error just referred to, viz., of attempting to treat the constipation by drugs or by increasing the amount of fat in the formula by the addition of cream or of top milk, or by employing both drugs and cream. Both methods are faulty. In the first instance he merely recognizes the constipation as a condition *per se*, to be relieved by the easiest method at hand. In the second instance he acknowledges the constipation as a part of a nutritional state, but is at a loss to know how to correct it dietetically, and, as just stated, attempts to overcome it by the addition of more fat. This is done also with the hope that the infant will gain. He has not recognized the fact that the excess of fat is the underlying cause of the constipation and of the failing nutritional state, and probably, although of course not necessarily, the only cause. The constipation is unbenefited. More commonly an acute alimentary disturbance is inaugurated with more or less rapidity. Diarrhea ensues. Vomiting, increased irritability, and slight temperature occur, and, as a result of these, marked depression of the weight curve becomes manifest. The stools are from five to ten per diem. They contain more or less mucous, soft, white particles, are acid in reaction, and are yellowish-green or green in color. If placed in water, fat droplets will float upon the surface. The stained specimen will indicate neutral fats and fatty acids. Many of the white particles, regarded as casein curds, will test out as soaps or fatty acids. The vomitus is rancid and smells like stale butter (butyric acid). Recognizing a pathologic state, the physician now withdraws all food, administers castor oil, and the acute condition subsides. He again inaugurates milk feeding, but usually repeats his former mistakes. Not having recognized the causal factor, the tolerance of the alimentary forces is again exceeded by a too rapid increase in the strength of the food, especially in the fat, and a renewed attack of acute alimentary disturbance ensues. The weight suffers again. The resistance becomes a little less; the infant is one step nearer complete nutritional bankruptcy — marasmus so-called, or the decomposition of Finkelstein! Usually, however, before this occurs, the child is referred to the feeding specialist or drifts into his hands.

Having had his attention drawn to this type of case, the experienced physician will

find little or no difficulty in recognizing it as being common, and will readily acknowledge the part he has played in its production, his lapse being his failure to recognize an excess of fat as the causal agent. In this connection it may be well to state that the quantity of fat may be increased beyond the point of tolerance not only by raising the amount of cream in the mixture but also by reducing the quantity of milk or diluent, or by feeding or forcing an excessive quantity of a formula whose strength is suitable to the particular baby for whom it has been prescribed.

With reference to the mechanism of production of this type of alimentary disturbance, it will be of some interest to refer briefly to the physiology of fat digestion, absorption, and metabolism. The fats of milk are neutral fats—*i.e.*, they represent a combination of a fatty acid with glycerin. In cow's milk the combination exists less firmly than in human milk, and the fatty acids are of the lower or more volatile type and are more irritating in their effects upon the gastric and intestinal mucosæ. This explains Wentworth's conclusion that the fat of human milk is tolerated much better than that of cow's milk (*Boston Medical and Surgical Journal*, 1910, and *Archives of Internal Medicine*, 1910). Neutral fats cannot be absorbed; they must first be split into soaps and glycerin. This is accomplished by the alkalies and ferments of the bile and pancreatic juice. If the alkali is present in sufficient amount to neutralize all of the fatty acids liberated, other things being equal, a normal stool is formed. If there be an excess of fatty acids but a sufficient amount of alkali to neutralize them, hard, dry, constipated, mucus-free, alkaline stools are formed. Thus we can account for the fact that an excess of fat may readily induce constipation, but it does it at the expense of the mineral metabolism, as we shall presently see. This is confirmed by the researches of Steinitz, Rothberg, and Birk, to which reference has already been made. If in addition to the sufficiency of alkali to neutralize whatever fatty acids may exist, there be incorporated in the stool more or less unchanged neutral fat, there results the greasy, bad-smelling, constipated stool met in this condition. We may now also understand why these babies do not gain in weight, as the unchanged as well as the emulsified and saponified fats are not all absorbed and are passed out *per primam viam*. If sufficient alkali be derived from the normal glandular secretions, the mineral metabolism does not suffer. If, on the other hand, a drain be made upon the salt reserve, as a result of a great excess of fatty acids, especially upon the calcium, in order to accomplish the saponification and neutralization, demineralization of the body will occur and the evidence of rickets and anemia will become manifest. Constipation will continue, however, as long as the amount of the free fatty acids does not exceed a certain point. Should this occur, as it commonly does, diarrhea results and demineralization as well as dehydration of the infant's organism progresses with alarming rapidity. An increase in the amount of fat in the food is usually responsible for the excess of fatty acids. There is not sufficient alkali to neutralize or to saponify all of the fatty acids set free, and these act as irritants to the intestinal mucous membrane and are directly responsible for the diarrhea, as they cause a great outpouring of mucus and an increase in the peristalsis of the gut. Mucus now appears in the stools. Mucus consists largely of water, salts, and protein. The loss of water causes a continuous loss in weight. The excess of salts, especially of calcium, in part neutralizes and saponifies the free fatty acids. This results in the formation of soap curds and of fatty acid curds. Dehydration and demineralization of the body are therefore rapidly progressive, and, together with the protein loss, sooner or later will indicate a marked fall in weight and the inauguration of the intensive features of rickets, nervous phenomena (spasmophilia), anemia, and an increased susceptibility to infectious and exudative processes.

It becomes clear, therefore, that fat improperly utilized by the body becomes a factor of great importance in the production of alimentary disturbances and of abnormal nutritional states, rickets in particular, the prevention of which is largely dependent upon a sufficient supply of this same fat. In other words, if we would prevent and cure rickets, we must supply fat in form and quantity to insure its proper digestion and absorption. To supply fat does not mean to overfeed with fat. If we overstep the individual's tolerance for fat, we do him a serious injury. Briefly, it may be stated that it is the amount of fat which is absorbed which favorably influences the economy and not the amount which is fed. A fire may be put out by smothering it with large coal, when it will burn brightly if given a proper amount of small coal and sufficient draught.

TREATMENT.

The essential of treatment, therefore, will be to supply an amount of fat which can be digested and absorbed readily. This can only be determined by learning the individual's tolerance. Tolerance is a broad term, and since at present we possess no method of accurately determining this beforehand, some experience with and observation of feeding cases become necessary. It is good management to commence all feeding cases, therefore, on a comparatively low fat content and to distinguish between well babies and sick ones, and to understand that the tolerance of the latter for any food must of necessity be lower than the tolerance of the former for the same food. It is my custom to inaugurate artificial feeding in the new-born or very young infant with diluted skim milk in the proportion of about 3 or 4 ounces, or less, in 20, and to gradually increase this to 5 ounces of skim milk in 20, meanwhile noting the effect upon the stools and the stomach. Should these present no abnormalities, it is now safe to remove three-fourths of the cream before agitating and diluting the milk; in the meantime the proportion of 5 ounces in 20 ounces is maintained. Then but one-half of the cream is removed; then but one-fourth; and finally well-shaken whole milk is employed in the amount of 5 ounces in 20 ounces. From this point, as digestion and weight indicate it, one ounce of diluent is replaced by one ounce of milk, and so on until whole undiluted cow's milk is reached. The amount of each feeding is gradually increased as determined by the appetite, the weight, and the caloric requirements. I prefer that all milk mixtures be boiled at least for five minutes. Antirachitic and antiscorbutic measures are of course employed.

With sick infants the details of the problem are somewhat different, although the essential principles remain the same. The stools must be carefully scrutinized and the irritability of the stomach determined, and the strength of the mixture which the infant has been receiving approximately estimated. In other words, it must be determined why the individual reacts abnormally to his food. We will assume a constipated anemic infant who vomits sour and is not gaining in weight. In the first place, investigation will usually reveal that the patient is being overfed—fed too much and too frequently, and that the composition of his food is too rich. A starvation period of twenty-four hours may be instituted, but is not always necessary. During this time it receives saccharated tea (saccharin gr. j to weak tea 1 quart), but no purgative is administered. The quantity of food in each feeding should be reduced, the interval perhaps lengthened, and the infant placed upon a skim-milk formula. The probabilities are, according to my experience at least, that the next thirty-six to forty-eight hours will show a gain in weight of from 3 to 5 ounces; that the baby will be more restful, although this is not always the case, as it may take a few days for the infant to become accustomed to its reduced rations; and that the bowel discharge will improve in character and in consistency. This latter result also is not always immediate. Meanwhile assistance may be

offered by suppositories, simple enemas of glycerin and water or of olive oil, but under no circumstances must purgatives be employed, especially castor oil. Occasionally milk of magnesia may be of service in that it assists in neutralizing any excess of organic acid. Frequently a change of the carbohydrate to one of the preparations of malt sugar on the market, instead of using cane-sugar or lactose, will not only overcome the constipation but will cause a rapid gain in weight. Malt soup extract also serves an excellent purpose in this type of case. Oatmeal-water employed as a diluent also acts as a laxative.

From this point on, as tolerance is established, a gradual change is made from skim to whole milk dilutions, and the latter are gradually strengthened, as previously indicated under the management of healthy babies.

Assume now the other type of fat disturbance, the principal features of which are vomiting, diarrhea, green or greenish stools, with mucus and soft curds, and loss of weight, with perhaps some slight temperature. This baby is in greater immediate danger than the constipated baby, for the depleting effects are more acute. This baby must be placed upon a hunger period for from twenty-four to thirty-six hours, receiving naught but weak saccharated tea. If it be toxic, not less than from 2 to 4 drachms of castor oil are necessary. Castor oil, however, should only be given if it be toxic. This baby will do well either on diluted skim milk immediately employed or it may require preliminary treatment of a few days, during which time it should receive a highly concentrated protein milk in which the protein is mechanically divided. The protein will transform the contents of the gut from an acid-fermenting medium into a decomposing alkaline one—*i.e.*, the calcium casein excess provided by the high protein food will combine with the fatty acids and produce a constipated calcium soap stool. In other words, we have simply completed the first stage of the treatment by transforming our baby with diarrhea into one with constipation resembling the first type of case just described, with the exception that the excess of lime has come from without by being supplied in the food and has not been withdrawn from the body —*i.e.*, by giving the excess of calcium casein we have neutralized the fatty acids in the gut, thus preventing them from abstracting these salts. We therefore make use of what, in the first instance, was a pathologic state and transform it for the time being into a benign one. From this point we proceed now as before with our skim-milk dilutions, gradually increasing as tolerance is established. A malt soup preparation may be employed. It is impossible to enter into the details of food preparation in this paper. It can only be mentioned that the excess of protein is provided by either Eiweissmilch (Finkelstein), Larosan, or by buttermilk preparations, all of which are low in fat content.

It must also be mentioned that the intolerance for one element of food may induce intolerance for another or all of the constituents of milk, simply because the functions of the intestinal tract have been weakened. As a matter of fact, a combination of etiologic factors is often in evidence in the individual case as met in practice. Therefore, other maneuvers are often of assistance. Thus, boiling will assist in the digestion of the protein. A temporary reduction in sugar may be useful, or change, as before indicated, to maltose may be made. Protein and fat digestion are further assisted by pancreatization or by the addition of pulverized flour-ball and pancreatin to the food in conjunction with heating.

1927 N. Broad Street.

UTERINE INERTIA.[1]

BY W. B. DOHERTY, M.D.,
Professor of Obstetrics in the University of Louisville, Medical Department, Louisville, Ky.

The factors concerned in labor are: (*a*) the powers, (*b*) the passenger, and (*c*) the passages. In a normal labor the active propulsive forces exercised by the uterine and abdominal muscles are just sufficient to overcome the passive resistance offered by the size of the fetus and the structures of the birth canal. If one of these factors be abnormal, labor will be delayed; but this may be of little consequence unless the abnormality is great; if two are abnormal, there is greater probability of a prolonged and difficult labor; if the three are abnormal obstruction will be complete. Even one abnormal factor may offer complete obstruction to the progress of labor, but it is less likely than if two or three factors are involved. On the other hand, instead of obstruction to passage of the fetus, excessive activity of the uterine or abdominal muscles, a small passenger in a capacious pelvis, or deficient powers of resistance, may induce a too precipitate labor, which is frequently associated with complications such as shock, laceration of the soft parts, inversion of the uterus, and rupture of the cord. Anomalies, therefore, whether relating to the powers, the passenger, or the passages, which disturb the equilibrium or balance between these factors, may result in more or less abnormal or delayed labor with or without serious effects to mother or child.

The following causes of prolonged or delayed labor may be quoted: Pelvic deformity; neoplasms encroaching upon the birth canal; malpresentations and positions of the fetus; rigidity of the soft parts; malpositions of the uterus; deficiency of uterine force due to general debility; premature rupture of the membranes; frequent child-bearing; age of the patient; intestinal disorders; oligohydramnios; polyhydramnios; pleural pregnancies; deficient uterine innervation; full bladder or rectum; mental influences; weak bearing-down efforts due to general debility; great suffering associated with uterine contractions; the patient may be narcotized.

The prognosis in any case will depend: (*a*) upon the stage of labor in which the delay occurs, (*b*) upon the cause, and (*c*) upon the condition of mother and child.

It is not the writer's purpose in this brief paper to dwell upon insuperable obstructions to the progress of labor which may be relieved only by surgical and mechanical procedures. These are rare compared to the frequency of inertia in which the balance between power and resistance is slightly disturbed, involving a tardy passage of the child through the pelvic canal, associated with great distress and suffering on part of the mother. It is to uterine inertia in occipitoanterior cases that I wish to particularly direct attention, with the hope of eliciting a generous discussion which may further elucidate the subject and assist us in relieving the woman in the throes of parturition, without having recourse to violent or somnolent measures which may involve the integrity of her tissues or the safety of herself and child. The subject I believe is one worthy of discussion in view of the distorted ideas of so many pregnant, non-pregnant, and childless women in reference to the treatment of physiological labor by bizarre and spectacular methods which have been lauded by magazine writers and advertising physicians.

I am well aware that in no two cases of labor is the course of the process precisely similar, although the vast majority are from first to last perfectly normal. Sudden and unlooked for changes may occur in an ordinary case. Much may depend upon the temperament and constitution of the woman. A thorough physical examination of the patient should be made at regular intervals, particularly during the last trimester of pregnancy. Her dietetics should be guarded, urine analyzed, blood-pressure taken, errors of metabolism cor-

[1]Read before the West End Medical Society, of Louisville, Kentucky, Jan. 9, 1917.

rected, position of the child diagnosed, fetal heart auscultated, elimination stimulated, and the pelvis measured.

As the general constitutional state of the patient may materially influence the efficiency of uterine contractions, as high a standard of health as possible should be maintained in the pregnant woman. As a prophylactic measure it has been clearly demonstrated by Bell, Duff and Edgar that strychnine judicially administered during the closing weeks of gestation will so give tone to the uterine muscles and nerves, as well as to the entire organism, as to result in powerful uterine contractions during the process of parturition. Under its use the appetite improves, digestion is facilitated, intestinal action becomes more regular, insomnia is controlled, circulation is improved, labor is rendered more normal and less painful. One-sixtieth grain three times daily may be administered during the beginning of the last month of cyesis, to be gradually increased to one-thirtieth grain during the final week, provided there be present no well-marked contraindications. It is also claimed that after-pains are less frequent under the administration of strychnine. In vigorous women with good muscular tone, the use of strychnine is prohibited; but in the neurotic, hypersensitive, and debilitated, who constitute the majority of our pregnant clientele, it is to be strongly recommended.

Before making a diagnosis of uterine inertia, care should be taken to ascertain if the bladder and rectum have been emptied, and a thorough examination made of the abdomen by palpation. The uterine contractions will be found weak, for the organ will not assume the intense hardness associated with good muscular action. A vaginal examination will reveal the condition of the cervix, whether soft and patulous or hard and rigid. If the head has not entered the superior strait, the Walcher position should be used.

Rest in a tedious first stage of labor, particularly in the primipara, may be considered as indispensable for the relief of suffering, and useful in husbanding the woman's strength for the trying ordeal to follow. The duty of the obstetrician is to afford a maximum of relief of suffering with a minimum of danger to herself and child.

In spasmodic rigidity of the cervix the administration of chloral hydrate ten grains every half-hour until three doses have been taken is the best method of securing relief to the cutting and grinding pains which produce intolerably acute suffering but with little effect on the progress of labor. It also acts as a relaxant to the hard and rigid cervix.

In patulous cervix uteri morphine and atropine, or still better morphine one-sixth grain with scopolamine (hyoscine) one-two-hundredth grain, may be administered—only once.

In the apathetic variety of inertia, in which the first stage is inordinately prolonged, warm compresses to the abdomen will oftentimes stimulate uterine contractions. An enema or a hot sitz bath will answer admirably well in certain cases.

In the case of a pendulous abdomen the application of a firm abdominal binder may straighten the uterine axis and shorten the duration of labor.

The woman may fall asleep, awaken free from discomfort, and no labor pains occur for hours or days; but neither the woman nor the child is in danger while the membranes remain unruptured.

We may then repeat that, in the first stage of labor, the duty of the physician is to give the woman all the rest possible by chloral, morphine-atropine, or morphine-scopolamine. Should there be inefficient pains instead of complete inertia, warm lysol douches with hot compresses externally may be used.

In the second stage of labor the administration of the sleep-producing remedies mentioned is entirely out of place, as they may now tend to narcotize the child. Here quinine ten grains may be given, or twenty grains by rectum if the stomach will not tolerate it. In the woman with feeble heart, strychnine one-thirtieth grain should be administered. Many women in labor do

not know how to utilize the abdominal muscles to "bear down," and therefore exhaustion and not progress ensues.

The bladder should be evacuated if it has not occurred spontaneously. If the uterine and abdominal muscles do not respond to efficient action, palpation of the abdomen and digital examination should be resorted to, and if possible the cause of the delay determined.

Change of posture from the dorsal to the side to which the occiput points favors its rotation. The squatting position with the arms pressed against the abdomen, which is assumed by instinct by savages, favors the descent of the head in the pelvic cavity and strengthens the action of the abdominal muscles as well as the uterine contractions. This is the posture described in the Bible in the first chapter of Exodus. The objection to the squatting position is the greater danger of a prolapsed cord.

When the perineum is distended the multiparous woman should be delivered on her side, but in a primipara with slow stretching of the parts it is advisable to keep the woman in the recumbent position until the equator of the head is delivered, then she should be turned on her side. Chloroform or ether should be administered.

The physiological effect of great patience on the part of the physician, his orientation in the sick-room, and his resourcefulness in encouragement, are strong factors, by their emotional influences, in stimulating the pains of labor.

We may be guided by the rule that after two hours in the second stage with impaction of the head and no progress in labor, the forceps may be applied. Maternal exhaustion and fetal asphyxia are the cardinal indications for the forceps; but instead of waiting in cases of delay until the mother shows signs of exhaustion, or until auscultation reveals the fact that the child's life is in jeopardy, the careful and educated physician will anticipate and prevent danger. As Barnes has said, we should wait to see what the woman is able to accomplish, not what she can endure. I do not hesitate to assert that the forceps when properly applied and skilfully manipulated by a judicious physician cannot possibly injure the mother.

Shall we use pituitrin in preference to delivery by forceps? The conditions necessary for use of the one are the same as for that of the other, viz., a vertex presentation and the passages open. The *vis a tergo* is assisted or relieved by an auxiliary force (the *vis a fronte*) by use of the forceps without danger; on the other hand pituitrin greatly increases the *vis a tergo* and endangers the integrity of the uterus by changing its normal muscular structure to that of tetanic contraction and producing violent expulsive action with injury to the soft parts.

As we will not give one-half grain of morphine to test its narcotic properties, I believe we are unjustified in experimenting with such an uncertain remedy as pituitrin for the purpose of saving time. Lee has condemned its use excepting in selected cases. Edgar in the last edition of his great book published a few months ago, after it had been tested in the hospitals of New York, says the action of the drug (pituitrin) is uncertain; that tempestuous contractions may follow when given in the face of too much resistance; that one cannot predict in a given case from the amount of the drug administered or the character of the inertia how powerfully it will act upon the uterus; that 0.2 gramme (one-half the usual dose) produced such prolonged and powerful contractions that uterine rupture was imminent and anesthesia was required; that in no stage should pituitrin be given unless anesthesia is at hand.

I repeat that we are not justified under any circumstances in endangering the life of the mother or injury to her soft parts by unnecessary and often dangerous experimentation for the purpose of saving time in our cases of labor.

DISCUSSION.

DR. H. J. PHILLIPS: Every medical practitioner has doubtless done something in obstetrics. Specialists in diseases of the eye, ear, nose and throat, in surgery, in

urology, have all probably attended parturient women, and are therefore familiar with uterine inertia.

There are several varieties of uterine inertia: (*a*) where labor pains are inefficient; (*b*) where pains appear sufficient but do not overcome the resistance; (*c*) where the pains are terrific yet no progress is made. The latter type will oftentimes tax the ingenuity of the practitioner. Two methods of treatment are applicable, depending upon the condition present. The first is stimulation, where the pains are ineffective; the second, which is directly opposite, is sedation, where pains are terrific but no progress is being made and strength of the patient must be conserved.

Dr. Doherty has mentioned some of the most appropriate remedies: (*a*) morphine and scopolamine, which have been extensively used under the popular name of "twilight sleep;" (*b*) anesthetics, chloroform, ether, and nitrous oxide gas; (*c*) chloral hydrate.

The essayist has strenuously objected to pituitrin, yet probably every gentleman present will mention this drug in discussing his paper. It is remarkable in how many cases pituitrin has been used indiscriminately with no untoward effects. It has been said that cases suitable for the exhibition of pituitrin will get along very well if left to themselves, yet this drug may act as a "therapeutic forceps" and thus help the patient through the trying ordeal.

The essayist stated that 0.2 gramme of pituitrin caused ill effects. I fail to understand how three drops of pituitrin could have any influence whatsoever upon uterine action.

The most trying cases are those in which there has been no progress and the patient has become practically exhausted. An opiate is necessary in such cases to promote rest and allow the patient to regain her strength. While remedies should not be administered in a haphazard or careless way, I have always felt that it is advisable to get the patient through with her pain and trouble as soon as possible.

Many physicians dislike the practice of obstetrics; they say that they "do not object to treating women and children if some one else will deliver the babies," and many of them would not answer an obstetrical call if they could retain their practice without doing this kind of work.

Dr. C. L. Nichols: I have lately used smaller doses of pituitrin than formerly. Five minims will produce uterine contractions. Little difference has been noted between the results secured from five minims and one-half Cc.

No conscientious physician would think of giving pituitrin merely for the purpose of hastening delivery to save himself time. The patient should be carefully watched, and pituitrin administered in small doses at the proper time to facilitate delivery.

Simply because certain practitioners have had disastrous results is no reason why we should condemn a drug which will many times obviate forceps delivery. The following case is mentioned to illustrate this point: A multipara was having weak labor pains every half-hour; the cervix was dilated, but the membranes were unruptured. I could have administered pituitrin and delivered this woman within twenty minutes. I waited two hours for the nurse, there being no progress in the meantime, the pains not being sufficiently strong to cause engagement of the head in the superior strait. After the nurse arrived I administered five minims of pituitrin, and delivery was accomplished within half an hour. What objection can there be to such a procedure? Without pituitrin labor would probably have been prolonged and the application of forceps might have been required. When the time for labor has arrived I see no reason why we should not give pituitrin and complete the delivery.

Quinine in ten- to twenty-grain doses, as usually recommended, is more dangerous than one Cc. of pituitrin, and yet this drug is advised when uterine contractions are weak. It is recognized that large doses of pituitrin may cause violent uterine contractions and postpartum hemorrhage unless followed by ergot. Where pituitrin is used I always prescribe ergot for a few days

afterward, and have never seen any untoward results.

Dr. H. L. Read: If Dr. Doherty knew more about pituitrin, I believe he would change his opinion concerning its usefulness. He is correct in stating that no one should administer as much as one Cc. of pituitrin as the initial dose. I have given this quantity, but will never do so again. He is also right in suggesting that before administering pituitrin the obstetrician should have chloroform ready, because the drug may act in two minutes or in fifteen minutes; it may produce a violent uterine contraction which will continue practically without intermission for ten or fifteen minutes. In such a case the woman is in danger and chloroform should be given at once, whether the fetal head is engaged in the pelvis or floating above.

The profession having at first called for a strong preparation of pituitrin, the manufacturers have placed it on the market in ampoules of one Cc. each, with the suggestion that the contents of one ampoule is an average dose. I have not given as much as one Cc. of pituitrin at a single dose in two years. I usually administer five minims, sometimes seven, and repeat the dose as required. When given in this way pituitrin is practically without danger. I give three minims in cases of uterine inertia, where the patient has been in labor twelve to twenty-four hours with no material progress. In the majority of such cases all the woman needs is a little assistance, and nature will do the rest. One dose of pituitrin merely starts uterine contractions. If a woman is delivered three hours after a dose of pituitrin, credit is not due the drug, as the effect does not last longer than an hour. This is the greatest effect of pituitrin, starting the uterine contractions, and when you have done that nature will assist in accomplishing delivery.

About two years ago I gave a woman one Cc. of pituitrin, and she was delivered within thirty minutes. The placenta was extruded a few minutes later. Everything seemed satisfactory and the woman was placed in bed. I was hurriedly recalled within forty minutes because the woman had a tremendous postpartum hemorrhage. I believe this was due to the large dose of pituitrin, and if it had been reënforced by the administration of ergot hemorrhage might not have occurred. On another occasion I gave one Cc. of pituitrin, and the baby was born within forty minutes; there was a violent cervical contraction, and the placenta could not be promptly delivered. The woman had severe pain, the cervix was rigidly contracted, and the placenta was still in the upper part of the uterus. In this case also I believe the trouble was due to the large dose of pituitrin administered.

Dr. E. H. Koch: I have had more than the average experience with pituitrin. I have not hesitated to give it in doses of one Cc., and have never seen any serious results follow its administration in that way. On the contrary, bladder evacuation has been more satisfactory, alvine evacuations have occurred more promptly, and after-pain has been less. Pituitrin stimulates uterine contractions, and I do not understand how it could possibly produce postpartum hemorrhage. I recall a remark made by the late Dr. Murphy, of Chicago, a year or two ago, that all remedial measures should be used with brains; and that is the way I feel about pituitrin or any other drug used in the practice of medicine or obstetrics.

Dr. J. E. Helms: The practice of obstetrics is largely a matter of common sense, and no two women are exactly alike. When I am called to see a patient in labor and find a contracted os, I give a hypodermic injection of morphine with hyoscine or cactine. During the next three hours she may have a certain amount of uterine contraction, and at the end of that period pains will develop, the os will be found dilated, and labor will soon be consummated.

I have administered pituitrin in a number of cases in one-Cc. doses, and have seen no ill effect following its use. Prior to using pituitrin I saw several cases of hour-glass contraction of the uterus, and have seen a few such cases since I began the use of this drug. It seems reasonable to assume that

pituitrin might cause hour-glass contraction; the administration of ergot would certainly produce it if used indiscriminately.

I have used quinine in labor, and in one instance attributed the death of an apparently perfectly healthy fetus to the use of this drug. The child was born dead without any apparent cause, and I believe it was due to the administration of twenty grains of quinine.

As to common sense in obstetrics, I would like to cite an example occurring several years ago: Dr. Barbour, who was then professor of obstetrics in one of the medical schools of this city, sent two students to attend a multiparous woman in labor. They failed to accomplish delivery and sent for Dr. Barbour. After examining the woman he concluded that delivery was impossible, and asked me to see the patient and bring my craniotomy instruments. It was a face presentation. The patient was a large plethoric German woman with a pendulous abdomen and roomy pelvis; but the child was impacted, and it was impossible to introduce the hand in order to turn it.

The instruments were ready, the woman was anesthetized, and Dr. Barbour was about to begin craniotomy, but before doing so I suggested that the woman be elevated so just her shoulders would rest on the bed, to see if there was not enough "slack" in the abdomen for the child to recede. At first he was averse to doing this, saying he had never heard of such a procedure, but finally agreed to give the method a trial. The woman's nether extremities were drawn over the foot-board of the bed, and we then had no difficulty in reducing the impaction, applying forceps, and completing the delivery. The child was born alive and is living to-day.

This case is cited merely to illustrate what may sometimes be done by the exercise of judgment and common sense. To have treated that case according to our book knowledge, or what the books teach us, would have meant sacrificing the life of the child and perhaps also that of the mother.

Dr. O. H. Kelsall: It is well that we occasionally have an opportunity to listen to papers of the character Dr. Doherty has read, because some of the things once learned we sometimes forget. His mention of chloral hydrate as a means of hastening cervical dilatation is a good illustration. I remember having used that drug many years ago, during my internship at the Louisville City Hospital, with excellent results.

I have used pituitrin in many cases with no ill effect. I do not hesitate to administer it in doses of one Cc. As to Dr. Read's cases, and his reasons for attributing the unfavorable results to pituitrin, I do not understand how he can make such deductions. For instance, in the case in which within forty minutes he was recalled on account of postpartum hemorrhage, how does he know that it would not have happened had he not used pituitrin? How does he know that the woman would not have had a postpartum hemorrhage immediately after delivery if pituitrin had not been used? In my opinion by producing uterine contractions pituitrin postponed the bleeding, and if another dose had been administered probably the hemorrhage would not have occurred. The same statement is applicable to the case of cervical contraction. Such things occurred before we ever heard of pituitrin. If accidents of that kind were common in the experience of others, then I might give credence to his statement that pituitrin was the causative factor.

Dr. J. D. Trawick: To the three postulates mentioned by the essayist there might be added a fourth, viz., the pernicious influence exerted by the nurse in the production of uterine inertia. Unless this fourth postulate is also eliminated, uterine inertia will be frequently observed.

Not infrequently it happens that the nurse will urge the patient to "bear down" from the moment she is brought into the case regardless of the stage of labor. Even before cervical dilatation has commenced the nurse will deliberately try to induce the woman to "bear down," and as a consequence the patient becomes exhausted from her efforts before labor has really started.

It must be remembered that when nature is ready for the woman to bear down, she does so involuntarily—she cannot help it.

The essayist is very specific in his recommendations concerning the administration of pituitrin. There must be: (*a*) a vertex presentation, (*b*) a perfectly dilated cervix, and (*c*) an occipitoanterior position, before he will permit the use of pituitrin. In my opinion the administration of pituitrin is unnecessary under such circumstances. Moreover, I believe pituitrin is yet in the experimental stage; it belongs to that class of remedies about which we know little or nothing, and until we can scientifically classify and apply our remedies, I believe we should be careful. I must confess, however, that some of the criticisms made tonight of pituitrin have been as inconsistent as the claims which have been made in favor of the drug.

Those of us who have had the privilege of visiting the Vienna clinics will recall how a large German nurse will grasp and manipulate the pregnant uterus with her hands; in this way engagement of the head is effected and delivery facilitated. The nurse does with her hands exactly what you are expecting to accomplish by the administration of pituitrin. The hands of a powerful nurse may be perfectly good obstetrical instruments sometimes; but we should not use the enormous force from behind produced by pituitrin in a delicate woman whose perineum is already about to rupture, and whose uterus has about reached the limit of tolerance.

Dr. Helms referred to the practice of obstetrics as a matter of common sense. I would like to amend his statement by saying it implies more than common sense. Scientific and expert obstetricians must use remedies according to scientific methods and principles.

Finally I wish to direct attention to the study of uterine inertia from the standpoint of infant mortality. Whatever may be the etiological factor of dystocia or delay in delivery, there is the underlying fact that the longer the child remains within the uterus, the longer it is pressed upon by whatever the force may be, the greater the likelihood of (*a*) a dead baby, (*b*) craniotomy, and (*c*) injury to the mother. Therefore careful study of our cases is necessary to determine the cause of the delay in labor, and to decide upon the most appropriate method of treatment. When we have delivered a normal child without injury to the mother, we have accomplished two things: (*a*) we have conserved the life of the mother, and (*b*) we have presented to her a healthy baby.

Dr. W. B. Doherty (closing): I must confess that my experience with pituitrin is limited to two cases. In the first I administered one Cc. and became very much frightened, as it produced the most tumultuous uterine contractions I have ever witnessed, and I feared rupture. In another case the same quantity was given with no effect whatever.

We should consider this matter from a strictly scientific standpoint. Why do you give pituitrin? It is administered to increase uterine contractions, to stimulate the *vis a tergo;* but you do not know just what may happen. Those who have had considerable experience claim that tetanic uterine contraction may occur at any time from the use of this drug.

As to the use of obstetric forceps compared with pituitrin: In the forceps you have a *vis a fronte,* you assist the woman by traction when the uterine contractions are insufficient to expel the child; but with pituitrin you are simply applying an inordinate force or stimulation from behind, and no one knows what danger may arise. Why should forceps not be used instead of pituitrin? If the os is fully dilated, the membranes ruptured, the passage clear, and there is no progress in labor, what objection is there to applying the forceps and assisting the woman? Is it not the safest plan to help her by gentle traction after the membranes are ruptured, the os dilated, and woman exhausted? Twenty minutes to half an hour is the time usually required to accomplish delivery with forceps. With pituitrin terrible damage may be done; there is no *vis a fronte,* it is entirely a *vis a*

tergo. I wish to insist that forceps should be used in every case in which the progress of labor is delayed beyond two hours in the second stage in occipitoanterior cases. It is safer to use the forceps than pituitrin.

We are told that one Cc. of pituitrin will produce uterine contractions which will persist for five minutes. That is something no woman can withstand. Normal labor pains do not last longer than two minutes. No woman can withstand severe uterine contraction for a greater period of time than two minutes, and then she must be allowed to rest.

I am willing to admit that good might be accomplished by the use of pituitrin if we knew more about its indications, method of action, indications, contraindications, etc.; but unfortunately no one is able to foretell the danger which may arise from its administration. Ergot could undoubtedly be used in all cases in which pituitrin is recommended with only five to ten per cent unfavorable results. Then why not use ergot? It will produce tonic contractions of the uterus and may result in great danger.

While the observations of one man may be as valuable as those of another, the conclusion of those having the greatest experience in obstetrics is that we do not know how to use pituitrin with safety, how frequently it should be given, nor in what dosage. Edgar and Lee claim it is an exceedingly dangerous drug, and like ergot I believe it will be relegated to the storehouse of oblivion before many years.

CLINICAL OBSERVATIONS ON SOME PHASES OF THE TREATMENT OF DISEASES OF THE HEART AND THEIR SEQUELAE.[1]

BY ROBERT ABRAHAMS, M.D.,

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Until the ideal treatment of acute and chronic diseases of the heart is discovered, drugs will be the mainstay and the indispensable agents in those affections. The ideal treatment will follow definite knowledge of the bacterial or other agencies which produce each and every lesion of the heart. The dawn of such a therapeutic millennium is seen creeping and breaking on the medical horizon. Thus serums, vaccines, and chemical compounds like salvarsan, are employed in cases in which the causative factor is known and settled. It is not so many years since septic endocarditis was the despair of the clinician, the opprobrium of the bedside. The adjective "malignant" vividly portrayed its dreadful nature. Today, many of us can point with pride to one or more cures of this heretofore hopeless malady. The results are obtained not by haphazard trial and speculation known as shrewd guessing, but rather by and through knowledge of the true nature of the causative organism. The millennium is on the way, but until it reaches its last syllable of recorded time we must approach the subject under discussion from the standpoint of practical, accumulated clinical experience; this experience is intimately and inseparably linked, and bound up, with drugs. The drugless treatment of chronic heart disease is the confused dream of medical somnambulists. All the celebrated "springs," and "baths," and "graduated exercises" are a disappointing bourne from which broken-hearted travelers return to kiss again the "ladies' fingers," botanically known as Digitalis. This is tragically true when sequelæ set in.

In the treatment of chronic heart disease, three points are to be kept in mind: (1) the condition of the heart muscle; (2) the nature of the defective valves; (3) the functional disturbance which, sooner or later, results from one or the other, or both.

Muscle degeneration requires treatment from the very inception of the trouble. Myocarditis implies, and produces, im-

[1] Read before the New York Physicians' Association, March 22, 1917.

proper contractions, and no matter what factor or factors bring about the condition of the myocardium, the heart needs the strong, stimulating influence of a cardiac drug. Even though a known poison like syphilis produces the degenerative process, and antiluetic remedies be applied, yet digitalis or its equivalent must be given at the same time. This conviction is borne upon me every day. I hardly except the case associated with high blood-pressure. In such an event the digitalis should be given, combined or separately, with one of the nitrites. The compound nitroglycerin tablet, made after the Da Costa formula, is very suitable here. The point to remember is that digitalis is not to be omitted. In myocarditis associated with low blood-pressure the withholding of digitalis is rank injustice to the patient. The fear that digitalis, by increasing the contracions of the heart, may rupture the degenerated muscle of the heart is founded on a hoary but hollow superstition. The ever-present dyspnea demands the use of the drug.

Valvular disease may exist for years without in any material degree discomforting the owner. The absence of discomfort is due to perfect compensation. Under such ideal circumstances cardiac drugs are not only uncalled for, but are absolutely injurious.

Functional disturbance follows a great number and a great variety of cardiac affections. The causes are numerous and the manifestations are varied. For my part, every form of permanent, and some forms of temporary, or paroxysmal disturbance, in the force, rhythm, regularity, and rate, have a pathological basis. All the cardioneuroses have a pathological basis, although in some of them the lesion is impalpable and defies investigation. The subject is too large for one paper, and therefore I will limit myself to the discussion of a few types of functional disturbances of the diseased heart.

Extra-systoles associated with a normal pulse-rate, as a general rule, need no treatment. The extra-systole annoys some sensitive patients, but rest and reasoning quiet and satisfy them.

Auricular fibrillation is the most disturbing element in the function of the heart. To that condition of turmoil, riot, and delirium can be traced, literally and figuratively, rapidity, irregularity, annoying and alarming sensations—yes, even heart block.

A fibrillating auricle is most commonly seen in mitral stenosis, comparatively rare in aortic disease. But whenever and wherever it appears, it calls for treatment. Digitalis shows its fine hand in this cardiac and functional disturbance. The larger the dose the better and quicker the results. The dose is from thirty to sixty minims of the tincture every four hours until the impulses reaching the ventricle are decreased; thereafter the dose can be reduced to half this size.

The antithesis of auricular fibrillation is heart block. This disturbance may be aggravated by digitalis; the proper and perhaps the only treatment for this unpromising condition is rest in bed and atropine, subcutaneously administered. The dose ranges between one-hundredth and one-fiftieth of a grain every four or eight hours.

Although the etiology of the different lesions affecting the heart is far from being an open book, yet much of it is known, and many profit by it in the treatment of heart disease.

Mitral disease is distinctly rheumatic—using the term in the old sense. Syphilis cannot entirely be excluded, but as a common factor in mitral lesions lues is negligible. Rheumatism, as a rule, is a non-progressive disease. The rheumatic virus is quick and decisive in its action, selective in its point or points of attack, but after the mischief is done it retires to a state of peace. Its choice is practically limited to serous and synovial membranes, although not all of the serous membranes are its prey, for nobody ever heard of rheumatic peritonitis. What shall be the attitude of the physician in the presence of a well-compensated mitral lesion? The answer is, "Hands off!" But this is only true as far as cardiac drugs are concerned. There is, however, an important duty to perform. This duty can be crystallized in

the following three points: (1) Removal of all foci of infection, for which a search shall be made from the mouth to the anus; (2) the administration of iron to combat the ever-present anemia; with aloes or cascara to overcome the never absent constipation. The most prolific source of endocardial and valvular disease in children is the tonsils. I strongly recommend the enucleation of these organs, whenever they show a tendency to inflammation, or hypertrophy, or plugging of their crypts. This procedure is in line with good prophylaxis both before endocardial disease takes place or after it has developed. The removal of the tonsils in the latter puts a check on further destruction of the valves, membrane, and muscle of the heart. In adults the association of tonsillar disease with endocarditis is not so frequent, but when the combination is present the tonsils should be removed. The tonsil is like the appendix, only one hits the endocardium and the other flays the peritoneum. Both are trouble-makers, and just as the removal of an appendix is advocated after it has shown signs of lurking mischief, so must a refractory tonsil be dealt with. The sympathy that some of our brethren display for these lumps of lymphoid tissue, possessing plenty of potential danger, should make the angels weep. It is true that the tonsils are ancient organs and therefore deserving of respect, but their antiquity does not entitle them to more consideration than the ancient appendix vermiformis.

The third point to observe in the management of well-compensated mitral disease is periodic administration of sodium salicylate and sodium bicarbonate in doses of twenty grains three times a day for a week, to be repeated every two or three months according to the individual's susceptibility to the rheumatic "diathesis." Any one who tries this method or acts on this suggestion will benefit his patients and will recommend this practice to his colleagues. A parallel to this is found in the treatment of syphilis; for though there be no active luetic manifestations, mercury and iodides are given for the sake of safety and security. I entertain a strong clinical conviction that the periodic exhibition of salicylates and alkalies in known rheumatics, though their cardiac and arthritic trouble is quiescent, serves an admirable purpose for the good and welfare of the afflicted individuals.

The management of aortic disease radically differs from that of mitral affections, because the etiology of the former radically differs from that of the latter. Aortic lesions are often syphilitic. The number of "aortics" which are not due to syphilis is negligible in the young and the middle-aged; in the old, aortic disease is an inevitable consequence of senile degenerative processes, and requires comparatively little medication. Now, since syphilis is the etiological factor and since syphilis is a progressive disease, it is evident that the moment the diagnosis is made the patient should be submitted to a well-planned antiluetic treatment. This treatment includes salvarsan, mercury, and iodides. Salvarsan is well borne by a syphilitic heart no matter where the lesion is located. A Wassermann test is both desirable and called for, but if it proves negative, specific medication should be continued just the same in the hope that intensive treatment may result in a positive Wassermann. The periodic treatment of aortic lesions with mercury and iodides is essential to successful prevention of further destruction of the parts involved as well as limiting and checking the extension of the process to adjacent and contiguous parts like the heart muscle, the coronary arteries, and the arch of the aorta. This treatment is independent of the presence or absence of any degree of functional disturbance. Arsenic and iron are splendid adjuvants to the antisyphilitic drugs because in aortic affections there is always a great amount of anemia present. The same medication and the same management are applicable to syphilis of the heart and specific aortitis—all three frequently go together.

The appearance of sequelæ in heart disease is an announceent of failure of compensation and a summons to therapeutic action. The number of sequelæ and their severity are an index and a guide to the

amount and degree of ruptured compensation; for example, dyspnea on exertion means slight decompensation, while orthopnea indicates complete failure of the heart. The number and severity of the sequelæ constitute the measure of the therapeutic activity. Mild dyspnea is easily corrected by a few days' rest in bed with or without the use of digitalis; severe dyspnea demands both rest in bed and the liberal use of digitalis: either the tincture twenty minims t. i. d., or the infusion half an ounce t. i. d. Orthopnea requires much larger doses of the drug—from a half to a drachm of tincture three times a day until the distressing asthma is under control. Excellent and supreme as digitalis is in the management of this painful condition, it frequently proves inadequate. Morphine has to be resorted to—morphine subcutaneously, and in no other way. Morphine never fails to relieve and improve the terrible hunger for breath, the tightness of the chest, and the horrible choking sensation that go with shortness of breath. Anybody who ever watched a person suffering from severe dyspnea and noticed the rest, the sleep, the calm induced by one injection of a quarter of a grain of morphine, will never withhold it from the pitiful sufferer. The dose may have to be repeated in a few hours, but that does not matter. It is truly balm to the mind and to the sore heart rest.

Morphine, the greatest drug in creation because it is the greatest enemy of pain, is foolishly dreaded by many physicians in the management of the terminal stage of heart trouble. And yet it is the equal of digitalis and at times its superior. A combination of the two forms an ideal partnership which raises the tone of the broken heart and buoys up the dejected spirit of the victim.

Cyanosis as a sequel to heart disease is a twin sister to dyspnea, and consequently the management of one is the servant and handmaid of the other. Yet cyanosis has an additional remedy in venesection. Bloodletting in deep cyanosis may, in some cases, be credited with life-saving. Oxygen, which is resorted to so often, is of no value.

Dropsy is both dreaded by the patient and the physician. It is a formidable and stubborn sequel to cardiac disease. Its management, however, is in accordance with the amount of effusion. Small exudations, spoken of as edema, can be successfully removed by rest in bed and the tincture or the infusion of digitalis, 20 minims of one or a half-ounce of the other three times a day, continued as long as the edema lasts; thereafter half the amount, practically as long as the patient lives. Edema which extends to the legs and thighs is successfully treated in the following ways: Epsom salt or potassium bitartrate in drachm doses three times a day; digitalis in above-mentioned doses every four hours, continued until the effusion is visibly diminished. After that the cathartics are discontinued, but the digitalis must be kept up indefinitely. Or, if this method is disappointing, the Niemeyer pill may be used with benefit. The pill consists of powdered digitalis and powdered squill one grain each, calomel one-fourth grain; or the calomel is omitted, and in its stead blue mass or gray powder one grain may be used. Some prefer a capsule to a pill; whichever it is, it is given one every three hours, until at least twelve are taken.

In case of extensive dropsy or anasarca, the calomel treatment is ideal—3 grains three times a day for three days in succession. It may, and perhaps should, be combined with ten grains of bicarbonate of sodium. The addition of the latter helps to prevent ptyalism. Calomel given in this dosage and for this length of time acts as a diuretic. In my estimation there is not a better diuretic in cardiac disease than calomel. I have used this drug in cardiac dropsy for at least twenty years "without regrets." I have used it in adults as well as children, the dose in children being two grains three times a day. Calomel in this condition exerts its action and effect upon the kidneys, so that at the end of the three days the patient begins to pass enormous quantities of urine. I saw tremendous anasarca disappear in twenty-four or forty-eight hours.

The effect of the calomel on the bowels is comparatively little. Most patients have no more than six or eight watery evacuations. Occasionally the calomel does not act until the patient receives two or three doses of diuretin. It seems that in some individuals the calomel needs a "chaser." The contraindications to the calomel treatment are: Bad teeth, soft gums, and chronic nephritis. A trace of albumin is no contraindication, as every cardiac who reaches that stage of the disease has traces of albumin in the urine. While the calomel is being taken, an antiseptic mouth-wash should be used every half-hour while awake; its use to be continued for a few days thereafter. The calomel treatment can be safely repeated, in case of complete or partial failure, in five days or a week. It must be recorded, however, that at times and for some unaccountable reason calomel completely fails as a diuretic. I noticed that the failures mostly occurred in those patients who had the dropsy for a long time, or in those cases in which the dropsy had reappeared for the fourth or fifth time.

When this treatment is unsuccessful, the next one may be tried: Calomel 2 grains, elaterin 1/10 grain, and compound powder of jalap 1 drachm, per dose—one dose every two hours until six doses are taken. This treatment forces the dropsy to make its exit through the rectum.

The next is the diuretin treatment: Diuretin 20 grains every two hours for twelve consecutive doses. The result sometimes is magical.

Mention must be made of a new preparation which frequently gives surprisingly good results, especially in mixed dropsy due to kidney and heart disease. I refer to cymarin. This drug is the active principle of apocynum. It is prescribed in silver-coated pills or ampoules; the latter is used in emergency and hypodermically. The pill is given every four hours until the desired effect is produced. I have often given two every four hours. The most recent case of extreme anasarca that I saw was a patient of Dr. M. A. Goldberg. Cymarin tablets were given, two every four hours, with wonderful results.

Pricking the skin of the legs and the employment of Southey tubes are valuable means to relieve dropsy, but one must observe extreme asepsis, as erysipelas or an erysipeloid rash will appear, making the cure worse than the disease. In large and universal dropsies, digitalis frequently fails ignominiously; in fact, at times it works harm. Instead of increasing the flow of urine it either diminishes it or entirely suppresses it. It is best to dispense with it while a selected diuretic is administered. As soon as the flow of urine is well established and the swelling begins to go down, digitalis is given again with good effect. Milk should be the diet while the battle with the dropsy is raging, so to speak—eight ounces every three hours, and nothing else. It goes without saying that water in every form be withheld while the treatment lasts. So well an established surgical procedure as paracentesis, which is practiced by every physician, need not be discussed here.

Insomnia may be classed among the distressing and urgent sequelæ of heart disease. To treat this condition properly, one must divest himself of the fear of morphine in heart trouble of any kind, for there is not a better drug to produce sleep in the unfortunate cardiac patients than morphine. The first dose should be administered subcutaneously; the second can be given by mouth. After morphine starts the good work, sleep can be secured by any of the following hypnotics: Medinal, trional, or sulphonal. Medinal, in my estimation, is the best of all the hypnotics suitable in this condition. It is given in warm milk every three hours if necessary—a five-grain dose given to a patient who has never before taken a hypnotic is quite sufficient to produce six or eight hours refreshing sleep.

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EDITORIAL.

THE VALUE OF GENITO-URINARY ANTISEPTICS.

We have often called attention in these pages to the fact that unless a drug has a particular affinity for some form of parasitic protoplasm it cannot destroy this protoplasm without doing damage to the more highly organized tissues of the human being. It is this fact which stands in the way of the administration of so-called antiseptics in the treatment of many infectious diseases, and in the infections of the genito-urinary tract it has been urgently desired that something might be found which, when taken by the mouth, would be eliminated by the kidneys and possess active antiseptic power. While the results along this line have been better than in the case of infections in other parts of the body, they have, nevertheless, been disappointing because this failure does not alone lie in the reasons just given, but also depends to some extent upon the pathway of infection. When it is through the blood there is a continual reinfection taking place in the genito-urinary tract, and this is possibly also true when the infection is from below. One of the reasons which have been advanced, however, to throw doubt upon infection from below upwards has been that it seemed unlikely that microörganisms would find their way up the ureter against the stream of urine into the pelvis of the kidney.

In this connection an interesting contribution to the *Journal of Medical Research* has been made by Eisendrath and Schultz, who have demonstrated the presence of an anastomosing network of lymphatics in the wall of the bladder and of the ureter, communicating above with a similar lymphatic network in the renal pelvis and parenchyma. At its lower end this system communicates also with the lymphatics of the pelvic structures, in both the male and female. Other conclusions reached by these authors are as follows:

Infections of the bladder or lower ureter may reach the renal pelvis or the kidney, either by way of the lumen of the urinary tract or by way of the mural lymphatics.

Experimental and clinical evidence indicates that almost complete obstruction to the free passage of urine is necessary for the ascent of infection by way of the lumen of the urinary tract.

Experimentally they have shown that infection, set up by the simple introduction of bacteria into the bladder without injury or without obstruction, may pass upward by means of the interstitial lymphatics of the ureter.

The degree of involvement following the introduction of bacteria into the bladder depends upon the virulence of the organism and upon the susceptibility of the animal. The subsequent tissue reaction may remain limited to the bladder and ureter, it may pass upward to the tissues of the renal pelvis, or even the parenchyma of the kidney itself may become involved.

When the kidney tissue is involved in ascending infection brought about experimentally, as described, the path of travel is from the subepithelial tissues of the pelvis to the kidney by way of the intertubular and perivascular lymphatics.

From the kidney the perirenal tissues may become involved through the capsular lymphatics, which anastomose with those of the cortex.

The experimental evidence indicates that, in cases of pyelitis and pyelonephritis in the human, secondary to infection of the bladder, the lymphatics constitute the most important course of upward travel of the infection, especially in those cases in which there is no hindrance to the urinary outflow.

Pyelitis and pyelonephritis, not secondary to cystitis, may also be the result of lymphatic transport of infection from the pelvic organs in the male and female, and from the lower intestinal tract.

The extension of infection by these lymphatics is another adequate explanation

for the failure to do good of antiseptics administered by the mouth for elimination by the kidney.

THE WASSERMANN TEST IN CONNECTION WITH THE DIAGNOSIS AND TREATMENT OF SYPHILIS.

The month of January, 1917, brought forth the first issue of the *American Journal of Syphilis,* which is designed to inform the profession more and more concerning this universal disease, and it emphasizes the statement of Osler that if one knows syphilis in all its manifestations and relations he is practically familiar with everything in medicine, at least so far as pathology is concerned. This first issue of the *American Journal of Syphilis* contained a number of articles of the greatest possible importance, and we earnestly trust that the quality of the material may be maintained in future issues.

One of the most interesting articles is contributed by Craig, of the Medical Corps of the U. S. Army, and when it is recognized that the conclusions which he arrives at are based upon the results of nearly thirty-five thousand Wassermann tests, personally performed, it can readily be understood that his statements are authoritative, particularly when we recall the very important contributions which this eminent man has made to other forms of parasitic disease. The opening pages of his paper point out that the Wassermann test is the most valuable aid we possess in the diagnosis of syphilis. He also emphasizes the fact that many mistakes have been made in the interpretation of the results of the reaction, and that many of these mistakes have been due almost entirely to carelessness or inexperience. Also it will interest many of our readers to know that the exact nature of the reaction is still a mystery despite the immense amount of work which has been done in trying to solve this problem.

It is not possible to consider all the points he discusses in a rather lengthy contribution; there are, however, a number which are of particular interest to the general practitioner. One of these is his confirmation of the results obtained earlier by Nichols and himself as to the effect of the ingestion of a considerable amount of alcohol upon the results of the Wassermann test. Further experience confirms him in the belief that the taking of alcohol in the form of beer or whisky in amounts equaling six ounces of whisky or one and a half pints of beer will often convert a positive reaction into a negative, the blood remaining negative for as long as three days, although it generally reverts to its positive condition within twenty-four hours. Smaller amounts of alcohol will also render a strong plus reaction negative in certain cases, and thus give a wrong impression regarding the efficiency of any treatment which is being pursued. In other words, in making a primary test to determine whether the patient is syphilitic, the test must be made after the patient has been free from alcohol for some time, and when the test is used to gauge the efficiency of remedial measures the patient must be forbidden alcohol for twenty-four to thirty-six hours before his blood is taken. It is also interesting to note that the growth of various bacteria in the blood serum may give a false positive reaction with the Wassermann test. Although this has been known since 1911, Craig's further investigations confirm him in thoroughly believing this to be true—that is, common organisms such as the streptococci and the staphylococci developing in the blood serum may give a positive reaction when the patient is really not syphilitic. This observation is perhaps more important than that in regard to the effect of alcohol in producing a negative test, since it is conceivable that a positive Wassermann due to bacteremia might condemn a man to the belief that he was a syphilitic for the rest of his life. Other points of interest are the recollection of the fact that the Wassermann reaction is not absolutely specific for syphilis because other diseases may induce it. Of course, in this portion of the world these diseases are exceedingly rare in the majority of

cases. Malarial infection occasionally gives a positive Wassermann during the febrile stage, as do yaws, relapsing fever, some cases of leprosy, and, more important to the general practitioner, cases of diabetes in which acidosis is present. Craig states that amongst four thousand patients suffering from diseases other than syphilis he obtained twelve positive reactions, or 0.3 of one per cent. Of this twelve, five were suffering from tertian malarial infection; three were diagnosed tuberculosis; three, pityriasis rosea; and in one the diagnosis was not determined. Vedder has obtained similar results in 1049 individuals suffering from other diseases than syphilis, or 0.4 of one per cent.

A very important point is the date of the appearance of the reaction in syphilitic infections, because the earlier the treatment is instituted in syphilis the better are the results. While it is true that the ideal method of diagnosing syphilis in the primary stage is by finding the spirochetes with the dark-field apparatus, this measure is sometimes unsuccessful. Craig differs positively from those who believe that the Wassermann test is of little value in the primary stage, and states that in his experience nearly ninety per cent show positive reaction if repeatedly tested before the apparance of the secondary symptoms. He points out that thirty-six patients in the primary stage gave a positive reaction within the first week after the appearance of chancre; almost sixty per cent during the second week; seventy per cent during the third week; and over seventy-seven per cent during the fourth week; during the fifth week after the chancre appeared it was positive in eighty per cent. This information is all the more valuable because the profession has always recognized that the clinical diagnosis of the primary stage of syphilis by determining whether the initial lesion is a Hunterian sore has been notoriously uncertain. Hundreds of cases have been labeled syphilitic because the sore was thought to be Hunterian, and hundreds of others have missed treatment because the opinion has been negative. Craig thinks that, with the exception of the few maladies just named, the presence of a double-plus, or as some people call it four-plus, reaction is diagnostic of syphilis, absolutely, whether symptoms are present or not, and whether there is or is not a history of infection. A three-plus, or as some people call it a two-plus, may be regarded as diagnostic, provided there is a clear history of infection, or suspicious symptoms are present. It should not be regarded as absolute in the absence of associated facts. The diagnosis of syphilis should never be made in the presence of a plus-minus reaction, since many apparently normal individuals give this type of reaction. On the other hand, a single negative reaction should not be relied upon to exclude syphilis when any suspicion of this disease has been raised. Only when a negative reaction is repeatedly obtained for a long period of time in the presence of suspicion can the patient be given a clean bill of health. Equally important, when a patient has been under treatment and gives a negative Wassermann reaction he should not be given a clean bill of health from a single test, nor after several tests until a provocative dose of salvarsan has been given a year after treatment, when, if the reaction is negative, the spinal fluid should be tested and the luetin test applied. If all of these are negative the patient may be considered as free of the disease. It is to be recalled that a positive reaction induced by a provocative dose generally occurs within forty-eight hours, but sometimes this is delayed for as long as seven days. Craig believes that this test with a provocative dose is an exceedingly important one, and in some early primary cases in which the Wassermann test was negative the injection of a small dose of salvarsan promptly produced a positive reaction, a fact not to be forgotten. The dose used was usually 0.3 or 0.4.

In connection with cerebrospinal syphilis it is pointed out that the blood is often negative, although in paresis it is almost always positive. In many cases, too, the blood will be negative and the cerebrospinal fluid positive; indeed, no patient should be

considered as cured until the cerebrospinal fluid has been tested. In making these tests a proper amount of blood should be used —not less than one Cc., since smaller quantities may give a negative result. Thus, if one Cc. is used the blood or cerebrospinal fluid will give nearly one hundred per cent positive, but only about ten per cent if 0.2 Cc. is used. These facts hold true also in regard to locomotor ataxia.

In concluding his paper Craig reiterates his profound belief in the value of the Wassermann test as a guide to treatment. By its use one is able to diagnose relapses long before the appearance of clinical symptoms in the vast majority of cases, thereby instituting treatment in time. In other words, Craig believes that in many cases the first symptom of relapse is the recurrence of a positive Wassermann reaction, which may appear weeks, or even months, before symptoms develop. Many of the most serious late manifestations, as affecting the nervous system, have developed in patients who, twenty years before, had been given a clinical diagnosis of a cure.

Doubtless the thorough employment of the Wassermann test in future will save thousands from the disastrous and horrible late result of this disease, and the profession, as well as the laity, are once more under a debt of gratitude to the Medical Corps of the Army, as represented by Craig, for the splendid work which he and his collaborators have done.

In this connection attention should also be called to the paper by Peterson on the "Use of the Wassermann Examination in Obstetric and Gynecologic Practice." He points out that Colles' law that healthy mothers of syphilitic children may nurse their children without contracting the disease has been shown to be untrue in recent years largely through use of the Wassermann test. The mother does not acquire syphilis from her child, because she already has syphilis, as revealed by this test. In other words, the test has shown that under some circumstances a healthy child can be born of a syphilitic mother, and every mother of a syphilitic child has the disease. Another point of importance is to recall that many functional disturbances in women, supposedly due to the derangement of the genital organs, may be due to unsuspected luetic infection, and that women who fail to recover their health after operation are often suffering from this infection and will be relieved by specific treatment.

TOBACCO AND BLOOD-PRESSURE.

It is a curious thing that a subject which is of so much general interest has received so little attention within recent years as the relationship between the use of tobacco and blood-pressure. Ever since tobacco was first used there have been attacks upon its employment, and some enthusiasts have even been inclined to the belief that it actually produced criminal tendencies, or conditions almost equally evil. Last year we called attention to an admirable article by Harlow Brooks on "Tobacco Heart," and we now call attention to an article by W. Gilman Thompson and William H. Sheldon, in the *New York State Journal of Medicine,* who have studied the effect of smoking in one hundred and nine experiments without reaching any very definite results. Most, if not all, of the experiments, however, were made upon men who already had developed arterial degenerative changes.

Physicians so often ask themselves the question as to whether the use of tobacco is harmful and are so frequently consulted by patients along these lines that our readers will be interested in the conclusions which Dr. Thompson and Dr. Sheldon have reached. These are as follows:

1. The maximum effect of cigar smoking was included in different cases within the limits of a rise of systolic pressure of 35 mm. and of pulse pressure of 22 mm. on the one hand and a fall of 30 mm. in systolic pressure and 34 mm. of pulse pressure on the other, the effects diminishing usually after about an hour.

2. In fifty-eight patients there was a rise of systolic pressure in 35 per cent and

a fall in 45 per cent, the remaining 20 per cent being unaffected.

3. The results were not always uniform in the same patient when recorded at long intervals, the same patient sometimes exhibiting a rise and less often a fall in systolic pressure.

4. The results were not uniformly proportional to the degree of initial blood-pressure in the individual patient. That is, patients with an initial systolic pressure of 160 to 170 mm. showed as much variation after smoking as those with an initial pressure of 250 mm. or more.

5. In seventeen patients more than one observation was made, with a total of eighty-two experiments, to include the pulse pressure. In these cases the average rise equaled the average fall, being 11 mm.

6. The pulse pressure did not invariably rise with the systolic pressure, but occasionally fell or remained unaltered.

7. The effects of cigarette smoking corresponded in general to those of cigar smoking and were fully as variable.

8. Owing to the great variation in the effects of smoking produced in different patients, it is desirable that each case be separately studied before giving rules for controlling the habit. But it may be stated definitely that whereas the risk from an elevation in blood-pressure increases greatly the higher the initial pressure in the patient, it is undesirable for any one having a constant systolic pressure much above 200 to smoke; and secondly, smoking is equally undesirable for any one having a constant initial pressure above 160 mm. when the use of tobacco is found uniformly to produce a considerable rise in blood-pressure.

Summing up these conclusions, it would appear that when a man has a constantly high blood-pressure the use of tobacco is inadvisable, but otherwise we fail to see that any serious objection has been brought forward to its moderate use by healthy individuals, and when we use the term "moderate" we must consider the strength of the tobacco, the constancy of its employment, and the susceptibility of the individual in each instance.

TREATMENT OF HODGKIN'S DISEASE.

Hodgkin's disease, of unknown etiology, commonest of the primary infections of the lymphatic system, if tuberculosis be excepted, and with an acknowledged mortality of 100 per cent, has been the subject of intensive study, with an occasional announcement of temporarily helpful therapeutic measures. The study on the subject by Yates (*Wisconsin Medical Journal*, May, 1917), based on 63 cases, is of particular importance since he thus supplements his previous admirable work in this direction. In this number there are five acute cases and 58 chronic ones. He expresses the belief that the process is infectious, noting that, although it is non-communicable and that very few individuals are susceptible, after the process is once well established final spontaneous recovery seldom if ever occurs; yet throughout its course repeated and almost successful temporary defensive responses are manifested.

This is assumed to indicate that the infection is of low virulence, and that the affected individuals are incapable of a permanent protective reaction to the toxin, however it may be administered. These premises demand in therapeutic logic an early and adequate subtraction from the amount of the disease in order to place the balance of power emphatically and rapidly on the side of individual resistance and to maintain it there, through the elimination of every possibility of reinfection.

Further, this morbid process imitates the behavior of malign affections, notably of certain types of tuberculosis and of certain malignant neoplasms, especially the carcinomas, in so many details—as, for example in modes of dissemination, in direct extension, and in the nature of local and general resistance—that the nearly identical problems presented seem to demand the same solution. This is an additional indication for surgical intervention.

Finally, the rather numerous "cures" recorded in the literature, following an almost incredible number of methods of treatment, are without exception but temporary im-

provements. The improvement in the majority of instances occurred in spite of the treatment used, though in some doubtless it was fostered thereby.

Apparently a composite sequential series of treatments is demanded, including everything of proved or possible value, as it is quite out of the question, with one exception, to devise anything, however rational or irrational, that has not already been employed, all with the same ultimate results.

These conditions seemed to Yates to indicate the following methods:

To determine and to eliminate the portal or portals of entry of the infection, particularly those chronic lesions of skin or mucous membrane pointed out by Trousseau in 1865 and curiously never rediscovered, nor even given any practical recognition by therapeutists.

To extirpate so thoroughly all eradicable involved tissue in suitable cases as (*a*) to place the balance of power decidedly on the side of the individual instead of on that of the disease; (*b*) to eliminate this source of further infection and intoxication; and (*c*) to prevent subsequent physical and physiological debility through the continued growth of this tissue *in situ* and consequent pressure and irritation effects on surrounding structures.

To keep the balance of power on the side of the patient (*a*) by improving general health through hygienic measures; (*b*) to prevent by radiation, by immune serum, and by medication any extension of the disease; and (*c*) to repeat these treatments at intervals of a few months, unless other manifestations of progress of the disease, as determined by the patient's condition and especially by untoward changes in the blood picture, demand more frequent treatments or more radical interventions.

Three of these procedures require explanation.

It has long been held and frequently reiterated, notably of late years by Fischer and Dorothy Reed, that surgery, always of doubtful value, frequently was positively harmful, and that reëxcisions were seldom if ever justifiable. These views were based on the repeated observations that local recurrences, usually prompt, were the rule after the excision; and, moreover, that these recurrences often assumed a type more acute than the original process and were prone to hasten rather than to retard death. He has seen such recrudescences appear within a week. The explanation is simple.

A portal of entry (inflamed tonsils, teeth, accessory sinuses, patches of dermatitis, bronchitis, enterocolitis, etc.) is comparable to a primary lesion in carcinomatous processes. The records of earlier, less radical surgical treatment show that these foci of dissemination were constantly neglected, and that therefore local reëstablishment of the disease was a natural result, particularly since this affection seems limited at its inception to preëxisting lymphoid tissue, only secondarily extending therefrom to invade directly other tissues. Consequently if, in addition to this neglect, the primary excisions are relatively incomplete (and according to Yates's belief none is or can be actually complete in removing all potential lymphoid tissue), and are not therefore followed immediately and at intervals thereafter by intensive Roentgen-ray treatments, distressing experiences of aggravation of the disease are almost certain to occur. In addition, the constant liability to septicemia must not be overlooked.

On the other hand, radical extirpations preceded by removals of portals of entry, and followed by careful after-treatment, have proved that in favorable (less advanced) cases local recurrence may be reduced to a surprisingly low percentage (possibly less than 5 per cent), and that when they do occur under these conditions they are usually late and have assumed a much more chronic type of lesion. Such late lesions may be excised safely under local anesthesia, but afterward the site of operation should be treated with the Roentgen ray as if this late procedure were primary.

If extirpation is not to be complete, it should not be attempted. Meddlesome surgery in Hodgkin's disease is even more dangerous than in cancer. Such wounds

should be treated with the Roentgen ray immediately and repeatedly, as even in acute cases the liability to dissemination is thus reduced materially.

Medication of this group of cases has consisted since the days of Billroth in the administration of arsenic. It is without specific lasting virtue in any form yet available, from Fowler's solution to salvarsan. Some specific chemotherapy is urgently needed, but wanting this, fresh air, sunshine and proper feeding are infinitely superior to any drugs when there is no indication for tonics and the like.

A recovery can be accepted only when a person has been free from all evidence of the disease, including a normal blood picture, for five years. This period exceeds so far as can be determined the longest free interval on record. In those rare instances of late recrudescence the possibility of reinfection after a recovery has been established must be disregarded until the nature and methods of infection are determined absolutely, even though there is evidence of only incomplete temporary protective reactions.

Experience is still insufficient to determine the nature of a "normal blood picture" for individuals who have recovered after having had the disease develop beyond the incipient stage. The specific toxin has a selective action on hematopoietic tissues, wherein it provokes primarily a stimulative irritation and later produces progressive degenerative changes in these structures, from which regeneration becomes somewhat proportionately and increasingly impossible. Recovery occurring at any period, after complete regeneration is impossible, is bound to exhibit some evidence comparable to a cicatrix. It now appears that part of such evidence is more or less permanent impairment of the functions of lympathic tissue. Hence a subnormal lymphocyte count need not of itself be indicative of a persistence of the disease, although suggesting reduced resistance, if the other features of the morbid blood picture have returned approximately to normal, as determined not by a single count but by a series of observations extending over several months.

During the first year after the institution of treatment, improvement, however remarkable, and usually the first part thereof, has furnished virtually all of the "cures" recorded in the literature as the result of any method of treatment.

Therefore the results of a year or less in duration should be termed "temporary." During the second year a more accurate judgment is possible, and the term "apparent" is justified, as is also the term "probable" during the third and fourth years. In the fifth year and thereafter, the ultimate results become relatively more certain, though final judgment must be reserved until a complete necropsy presents conclusive evidence years after recovery has been accepted clinically.

The results of this most careful clinical study are no more than encouraging; palliations seem the rule, but cure must still have a large question mark after it.

BLOOD-PRESSURE FROM THE STANDPOINT OF THE SURGEON.

Blood-pressure as an index of longevity has been accorded increasing attention by life insurance agencies and its value in determining the individual's capacity for prolonged strain, it being widely discussed in relation to the physical examination of some odd million men shortly to be called into military service. It is generally recognized that a diastolic pressure is the best index of arterial tension and of peripheral resistance. In general terms habitual diastolic pressure of over 100 should be regarded as abnormal, as should a systolic pressure materially above 160.

Mueller (*Medical Record*, May 12, 1917) points out that the failure of the surgeon to regularly record and observe blood-pressure before operation is in many cases incident to the circumstance that such patients are sent by physicians to surgeons after they have studied the blood-pressure and made proper deductions therefrom and have esti-

mated the risk as a safe one to take. None the less it is undoubtedly true that before any major operation the surgeon should inform himself in so far as is possible concerning the competency of both the renal and the cardiovascular systems. The rough estimation of renal function is based on normal total quantity and specific gravity, a rough estimation of cardiovascular function on pressure, systolic and diastolic, recognized as somewhere near the normal.

Goepp states that the numbers 1, 2, 3 represent the value of pulse, diastolic and systolic pressures of the normal individual, and any considerable departure from this formula casts a doubt upon the risk of life insurance. This formula, however, holds only in normal cases, for it is a matter of clinical experience that individuals with high tension from any cause habitually show a pulse pressure in excess of the normal, say from 40 to 45 per cent instead of one-third. If, therefore, an individual with a high systolic pressure is to be considered at all as a possible risk he must at least show a pulse pressure slightly above the usual or normal. Goepp further states that it is well known that many individuals present habitually an abnormally high blood-pressure without showing any symptoms or pathologic changes to account for it, at least none that are discoverable by our present means of diagnosis, and yet the marked effect on life expectation of even moderately high blood-pressure is so convincingly shown by Fisher's statistics as to leave no doubt that, unless the condition which is responsible for the high pressure is removed, life will be shortened in a large proportion of the cases.

A systolic blood-pressure of over 140 mm. Hg, without other impairment, seriously affects the mortality; while applicants presenting a pressure in excess of 150 mm. Hg yield a mortality almost 50 per cent above the general average.

Individuals under forty years of age show even a higher mortality. Fisher notes that single observations on blood-pressure are notoriously misleading, and standing alone should rarely be relied upon. Serial observations and general averages of blood-pressure values are more reliable. It is a common experience to meet cases of abnormally elevated systolic pressure, even continuously above 200, that are comparatively far less serious, prognostically, when it can be demonstrated that marked nephritic and myocardial changes are absent, than are those with equally or less high pressures where the kidney and heart muscle change has outrun the arterial.

As applied to surgery the blood-pressure readings are of value mainly as indices for further examination, particularly in relation to renal function. High systolic pressure in itself is certainly no contraindication to a surgical operation for the remedying of a condition which in itself is undermining health and may indeed be a contributing factor to this continued high tension. The supplementary examination which should be made of these patients, and this particularly when the pressure readings depart from normal, consists in judging the effects of exercise. This will at times detect a latent weakness, perhaps suggested by the pressure readings, but not suggested by the appearance of the patient or by the history he gives at the time of examination. A heart overacting to moderate exercise and slow in recovery, particularly if this be accompanied by pronounced dyspnea, is always indicative of a vulnerable condition which leads to care in imposing a strain upon it.

REPORTS ON THERAPEUTIC PROGRESS.

INTRAVENOUS ADMINISTRATION OF MERCURY SALTS.

The *Wisconsin Medical Journal* for March, 1917, points out that in the modern treatment of syphilis, physicians are coming more and more to use the intravenous route to place drugs in the system. Salvarsan and mercury are the only two drugs which have proved their worth, and both in combination are generally admitted to be superior to either one alone. There is no reasonable doubt that syphilis can be cured by mercury alone. Inunctions are dirty and the mercury is not always absorbed. Intramuscular injection of soluble or insoluble salts is often painful, and the violent reaction produced tends to limit the absorption of the drugs. One is really working blindly, for there is absolutely no way of determining how much of the injected drug is absorbed.

The intravenous method is the method of choice, but it has several disadvantages. The chief one is that a phlebitis is started which frequently causes thrombosis of the vein. Then, too, if the drug should not enter the circulation but ever so little be injected into the tissues, the most distressing and painful swelling of the whole arm results. To obviate this disadvantage recourse has been had to the mercurialized serum, an albuminate of mercury which is formed when bichloride and serum are placed together. However, it is not necessary to use this. One can inject a solution of bichloride directly if certain precautions are rigidly observed. The dose is from 1/6 to 2/3 of a grain every third or fourth day.

The technique which is found useful is as follows: The dose of bichloride is made up to about 3 Cc. with normal saline. A fine, sharp-pointed, 20-gauge needle is then fitted to the syringe, great care being used that the mercury solution does not get into the lumen of the needle. The arm is now constricted until the veins at the bend of the elbow stand out prominently. The skin is wiped with alcohol and a quick thrust made into a vein. The piston of the syringe is pulled out, when the blood will flow into the syringe if the needle is in the vein. The constricting band is then released, the solution injected, and the needle left in for two or three seconds. *Before withdrawing it, draw blood back into the syringe.* In this method there is no chance of even the least fraction of a drop of mercury solution getting into the tissues. If this technique is strictly carried out, the *Wisconsin Medical Journal* feels sure that there will be no phlebitis and no tissue reaction.

REPORT OF FIVE CASES TREATED WITH CYANOCUPROL.

In *Colorado Medicine* for March, 1917, KUNITOMO reports further on this new drug, already referred to in the GAZETTE. He reminds us that in August, 1916, when the *Journal of the Rockefeller Institute* published an article about Dr. Koga's cyanocuprol for the treatment of tuberculosis and leprosy, the public were very much interested as to its effects; but very few physicians made a clinical test with it. When Kunitomo received the first shipment of medicine from Japan, he thought it his duty to notify every member of the profession, at least those practicing in the State of Colorado. He received a landslide of inquiries; but unfortunately, either from lack of experience or on account of the expense of the drug, not many physicians gave treatment with cyanocuprol.

Cyanocuprol is a chemical compound, the components of which are copper and cyanogen. The compound, after being treated by a special method of detoxication, is colorless, transparent, and has a neutral reaction. It comes dissolved in a saline solution in the proportion of 1 to 500.

Summarizing his experience up to date, he says that there is no doubt as to the treatment with cyanocuprol having an effect upon tuberculosis. There is one feature which will require further study. It is the fact that every patient contracts a

cold between the second and fourth or fifth injection, but without physical damage. Whether this is due to a cyanocuprol reaction or other natural causes, he is unable to say.

THE INTRAVENOUS ADMINISTRATION OF QUININE.

The *Lancet* of March 3, 1917, editorially discusses this subject, stating that until the extermination of the mosquito is complete quinine must continue to hold its place in malarial countries as a prophylactic and curative agent, and in cases in which it is not tolerated by the stomach, or it is desired to obtain an immediate and powerful effect, the intramuscular or intravenous administration has to be considered. Intramuscular injection is painful and may give rise to points of local necrosis, but is generally held to be safer than the intravenous route, although in either case the injection of tetanus spores should not be lost sight of. Speaking from a very large experience amongst African troops during 1915, M. Braun, director of the Marocean Service de Santé, states that ampoules containing 0.4 gm. of quinine hydrochloride in 1 Cc. of excipient, being non-isotonic and caustic, are liable to cause abscess at the site of intramuscular injection. Baccelli, who employed intravenous injection with much success in pernicious cases of malaria, used a solution made up as follows: Quinine hydrochloride, 1 gm.; sodium chloride, 0.75 gm.; distilled water, 10 gm. Apparently the fear of producing clotting in the vein is the chief drawback to this method, and in a paper by Captain A. C. MacGilchrist, I.M.S., this risk is fully considered, as well as the possible production of hemoglobinuria. Captain MacGilchrist concluded by advising a very dilute solution for intravenous use, viz., 7 grains of bihydrochloride in 2 to 3 pints of saline fluid. The work of three physicians, Dr. German Arellano, Dr. F. G. Miranda, and Dr. Fausto Robleto, at the San Juan de Dios Hospital in Granada, Nicaragua, suggests that Baccelli was right and that concentrated solutions of quinine can be injected safely into a vein. They have gone even further and find that the solution need not even be isotonic with the blood serum. Dr. Arellano and his colleagues speak of being daily confronted during the rainy season with rapidly fatal forms of pernicious malarial fever, and have found nothing so efficacious in the face of impending death as the intravenous injection of quinine. Concerning its administration they write:

"The first time that we employed this method with the happiest and most successful results, we were able to use Parke, Davis & Company's solution of quinine in sodium chloride and other salts; but unable to obtain the isotonic ampoules, we had no choice but to use the acid non-isotonic solutions of the chloride, bichloride, and chlorhydro-sulphate of quinine, as supplied in ampoules by Parke, Davis & Company, Clin of Paris, and others, diluted with an equal volume of warm sterile water. The results are simply marvelous, and we have never had the least trouble or accident. So sure, safe and efficient do we consider this method to be that we employ it now even in cases showing no signs of perniciousness. The patients merely complain of tinnitus, deafness, transient nausea, and a sense of heat spreading all over the body within one to ten minutes after the withdrawal of the needle.

"In all cases of pernicious fever we have found the worst symptoms, such as amaurosis, convulsions, algidity, and collapse, to disappear from three to six hours after the injections, though cases have occurred in which the patient was out of danger within the hour. The dose we employ is 10 to 25 or even 50 centigrammes, according to the age, state, condition, and symptoms of the patient. Children are also subjected, when the veins ars accessible, to the same treatment. In fact, in children it works wonders. Now, as it may be asked why we have not used Baccelli's formula, we will frankly state that in this town there are no pharmacies really reliable in which such solutions might be aseptically prepared, a fact which has led us to give preference to solutions which, acid though

they be, are most certainly aseptic and exactly dosed. The technique we employ is as follows: We mix the solution within the syringe with an equal amount of sterile warm water, taking care that no precipitate or coagulum is formed as the blood comes in contact with the solution. It has been observed at times, especially when time is lost in inserting the needle, that a kind of flocculent precipitate is formed very similar to that of 'aluvine' when injected intravenously; but, as in that case, experience has shown it to be perfectly safe, it being a sort of emulso-suspenoid."

The authors add that at first their procedure was severely criticized by their local colleagues, and in the daily press, until continued experience showed its safety. They offer no explanation of the non-coagulability of the blood by the acid non-isotonic solution, but commend other workers to test the fact for themselves.

THE NATURE AND TREATMENT OF SCIATICA.

In *Colorado Medicine* for March, 1917, PERSHING points out that it is to be remembered that the sacroiliac and the lumbosacral joints may be inflamed and swollen as the result of infection or subinfection. Sources of absorption are to be thought of, such as bad tonsils, pyorrhea, or hidden foci of infection.

Another source of referred pain is pressure on the nerve roots from disease of the spine, such as osteoarthritis. In such cases the sciatica is usually bilateral, but may be unilateral.

We then come to what may be called the idiopathic sciaticas, the ones that are of the nature of a neuralgia, a neuritis, or both. If it is not a neuritis due to toxemia or a systemic disease like syphilis or diabetes, we should use mild measures first, such as rest, stimulation of elimination, and counter-irritation.

The patient should be in bed in a comfortable position with the thigh slightly flexed and the knee flexed so as to take tension off the nerve. Elimination is helped by light diet, plenty of water, and the administration of salicylates in large doses.

Counter-irritation can be applied along the course of the nerve by means of small fly-blisters, whose location can be changed from day to day, or by the mild use of the Paquelin cautery.

If these means fail, more strenuous measures must be tried. Stretching of the nerve, once popular, seems to have been abandoned, and injections of the sheath of the nerve have taken its place.

The best place to inject the nerve is where it crosses the spine of the ischium. To locate this point on the surface, measure from the middle of the lower end of the sacrum to the upper end of the posterior border of the great trochanter of the femur. Find the junction of the inner and middle third of this line and measure one inch further. This point is also at the junction of the middle and inferior third of a line from the posterior superior spine of the ilium to the upper end of the tuberosity of the ischium. Having been found, it should be marked with nitrate of silver so that it will not be erased by the subsequent disinfection of the skin.

Various solutions have been used, from salt solution to dilute alcohol. The safest and best is probably as follows: One and one-half grains of novocaine are dissolved in three and a third ounces of physiological salt solution. This is sterilized by boiling, and then ten to twenty minims of a sterile one-to-one-thousand solution of adrenalin are added. About two ounces of this solution should be used.

The needle should be four inches long, strong, and with a beveled, not a sharp, point. The syringe should hold three ounces.

The operation must be done with aseptic precautions. With the patient prone the needle is inserted till it reaches the nerve, and then the solution is slowly injected.

The nerve is reached at varying depths, but not over four inches. Sudden pain in the course of the nerve gives notice that it has been reached.

This treatment usually gives relief and

sometimes cures, though it may have to be repeated. It seldom does harm.

If injection of the nerve trunk fails, the epidural injection of cathelin may be tried, especially if there is evidence of irritation of the nerve roots.

The needle is introduced perpendicularly in the midline, three inches from the tip of the coccyx, until the sacrococcygeal ligament is pierced. It is then pointed upward so as to enter the sacral canal without penetrating the dura mater, and introduced to a depth of one and a half to two inches. Two cubic centimeters of a one-per-cent solution of cocaine or 4 cubic centimeters of a one-half-per-cent solution of novocaine are injected.

SALVARSAN AND ITS SUBSTITUTES.

In the *Practitioner* for March, 1917, BUNCH in writing on this subject states that the latest antisyphilitic remedy, or substitute for salvarsan, is a French one named luargol, or "102," which has been used at the Hôpital Cochin in Paris and elsewhere with apparently great success. Luargol is a yellowish powder, soluble in sodium hydrate solution to the extent of 1 gm. to 0.4 Cc. of the soda solution, but it is insoluble in water. The powder dissolves best and most quickly if one gramme of it is added to 15 Cc. of a 4-per-cent solution of sodium hydrate. The solution is then dark-brown in color, or almost black, and it is injected intravenously in the same way as salvarsan, either in concentrated solutions, as in Ravault's method of injecting neosalvarsan, or in dilute solutions by a syringe with a three-way tap. The concentrated solutions must be injected slowly, and care must be taken that the needle is actually in a vein. Indeed, it is better after inserting the needle to make sure that it is in the vein by first attaching to it a syringe containing normal salt solution and injecting some of this. If it passes into the vein this syringe can be detached and a similar syringe containing the luargol solution fitted to the needle, and the injection of luargol made. When using a concentrated solution, the first dose given is 15 Cc. of a 1-per-cent solution, and five subsequent injections are given at intervals of two or three days of 20, 25, or 30 Cc. When dilute solutions are used, it is best to use a 1-in-1000 solution and inject 150 Cc. for the first dose, gradually increasing the dose to 300 Cc. The intervals are the same, namely, two to three days, and six injections should be given, so that the patient gets from 1 gramme to 1.5 grammes of luargol in all. The patient should go without food for four hours before and four hours after the injection, and should lie down after the injection. In cases with nervous or other complications, the dose must be diminished; in children and women, and in kidney affections, heart disease, and syphilitic meningitis, the dose must be quite small to begin.

The chemistry of luargol is somewhat complicated. It is an arsenobenzol compound combined with silver. Silver nitrate has, of course, long been used for syphilitic plaques, and colloidal compounds of silver as injections in septic conditions. Charcot showed how little poisonous silver is—indeed, poisonous symptoms were shown to appear only after absorption of 30 grammes of silver nitrate. Danysz, of the Pasteur Institute, tried to combine silver with an arsenobenzol compound, by mixing a solution of silver nitrate with a watery solution of dioxy-diamino-arsenobenzol. A clear, brownish solution resulted, and when sodium chloride was added to this a flocculent precipitate formed. On the addition of sulphuric acid a pale-yellow precipitate formed, and the fluid contained only traces of arsenic and silver, showing that silver and chlorine had been fixed by dioxy-diaminobenzol. Danysz then proceeded to replace chlorine, which has no therapeutic use in syphilis, by bromine. He thus obtained a bromo-silver-arsenobenzol, which proved very efficacious, and which is called "88.2." To improve the efficacy of this drug, he proceeded to add to it some trichloride of antimony, and so arrived at luargol, or "102." Luargol, therefore, contains silver, bromine, antimony, and 20.70 per cent of arsenic.

In sleeping sickness, luargol is 75 times more active than atoxyl, 30 times more active than arsenophenyl glycine, and 10 times more active than arsenobenzol. Danysz's experience shows that "102" has greater curative powers in trypanosomiasis than any other arsenical compound. Thus, the evolution of surra in rabbits is about the same as the evolution of trypanosoma in men. Fever and wasting follow an incubation period of five to seven days. Skin and mucous membrane lesions appear thirty to fifty days after inoculation. All arsenical compounds cure the animals, if treatment is started during the incubation period. If treatment is started during the second period, arsenobenzol, atoxyl, and arsenophenyl glycine give only a percentage of cures, while "102" cures them all. When lesions have appeared during the last period, "102" alone can cure five out of six cases, with a dose of 0.01 cg. per kilogramme. Other arsenical compounds in the same dose produced no beneficial results on the animals. It is remarkable how low the toxicity of luargol is, as compared with other arsenical preparations similarly injected — in other words, one-fiftieth, or less, of the toxic dose will have curative results in the animals. One-tenth of a gramme is a very small dose, and yet this is the initial dose recommended in the treatment of syphilis in females—in males it is a little higher—but the quantities of luargol required for the cure of syphilis are very much smaller than of salvarsan, neosalvarsan, or other substitute.

In the employment of all these arsenic compounds, unfavorable complications sometimes follow their injection. Thrombosis of the vein may occur, if the solution is not properly prepared or the soda used for neutralizing the solution is not chemically pure. Sometimes there is a rise of temperature, vomiting, headache, or gastro-intestinal symptoms, and a scarlatiniform rash has been seen. Still more severe symptoms of poisoning occasionally occur, such as convulsions, dyspnea, congestion of the face, accompanied by well-marked fever, and it has been shown by Danysz that such symptoms are always due to a precipitate of arsenobenzol in the circulatory system, and generally in the capillaries of the lungs, such as is brought about by an excess of phosphates and certain other salts in the blood. Such accidents can best be avoided by using a dilute solution for injection in preference to a concentrated solution.

Difficulty has lately been experienced in obtaining chemically pure sodium hydrate to dissolve the luargol, and this has accounted for some of the unfavorable results, but in future a sodium preparation of luargol will be placed on the market, which dissolves in distilled water like neosalvarsan, and possibly toxic symptoms caused by the use of improperly dissolved luargol will be eliminated.

THE TREATMENT OF LIVER ABSCESSES BY INTRAHEPATIC INJECTIONS OF EMETINE FOLLOWING ASPIRATION.

In the *Calcutta Medical Journal* for January, 1917, GHOSH says that there is one consideration worth remembering in the treatment of cases of liver abscess. It is the fact that all amebic abscesses, when they are of any size, require evacuation. He is not speaking of the very rare case of a small abscess or a case of doubtful suppuration. Rogers recommends this plan, prior to hypodermic injections of emetine. Foreign observers, too—for instance, Joseph Smits, of Sumatra—write from a large experience of cases that "liver abscesses should be evacuated. They do not yield to emetine injections." He clearly means to say that emetine injections alone do not suffice. Well, if that be the general experience and consensus of opinion, and the aspirator has to be used, is it not best to throw in a quantity of emetine in more or less direct contact with the amebæ at the same opportunity and cause no additional risk or trouble to the patient?—rather giving him a quicker cure. There would, indeed, then be a more or less direct kind of treatment against the amebæ in their most vulnerable form. Besides, a much stronger solution than that which is possible by

hypodermic method can thus be brought into contact with the amebæ, while no toxic symptoms are to be feared even, in spite of big doses like a grain and a half at once, as shown in two cases of the writer's, and especially in a boy who was only fifteen years old. He trusts that by using initially a still bigger dose, 2 grains or so, we can curtail the number of subsequent injections and the total expenditure of the drug. It appears then that on theoretical grounds, and on grounds of practically achieved results, the merit of this plan of treatment seems beyond question. And Ghosh says that the achieved results certainly justify the adoption of this plan of treatment in all cases of amebic abscess of the liver.

MODERN METHODS OF BLOOD TRANSFUSION.

LEWISOHN in the *Journal of the American Medical Association* of March 17, 1917, states that when he began animal experiments with sodium citrate with the object of using this drug in human blood transfusion, he did not by any means apply a new drug which had never been used before as an anticoagulant. In fact, sodium citrate was known as the most efficient anticoagulant, and was used extensively in laboratory work. A one-per-cent mixture of sodium citrate and blood was considered necessary for the prevention of coagulation. Furthermore, it was generally assumed that such a mixture would be toxic when used in the human being.

His experiments were carried out with the object of answering the three following questions:

1. What is the smallest dose of sodium citrate required to keep the blood from clotting?

2. Is sodium citrate atoxic in the amounts required for our purpose?

3. How does sodium citrate affect the coagulation time of the blood?

The results of these experiments were published *in extenso* in 1915. Lewisohn therefore mentions only his conclusions:

1. Two-tenths per cent instead of one per cent is the percentage of sodium citrate and blood required for the safe prevention of coagulation. Such a mixture prevents coagulation of the blood outside the body for from two to three days.

2. Five grammes of sodium citrate can be introduced safely into an adult. Large amounts are extremely toxic. He rarely transfuses more than 1000 Cc. of blood, which would represent 2 gm. of sodium citrate. However, even a transfusion of 1500 Cc. of blood would require only 3 gm. of sodium citrate, a perfectly safe dosage.

3. The introduction of citrated blood causes a temporary shortening of the coagulation time of the recipient's blood. The coagulation time returns to its previous level usually in less than twenty-four hours.

Before leaving this subject, Lewisohn would like to point out how the whole applicability of sodium citrate in human blood transfusion is based on the development of the small dose (0.2 per cent). This new fact was the most important result of the experiments mentioned above.

The technique of the citrate method can be divided into two separate actions, each of them well known to any practitioner. One is the venipuncture or, in exceptional cases, venesection of the donor's vein; the other is the intravenous infusion of the citrated blood into the recipient.

1. Obtaining the blood from the donor. A tourniquet is applied to the donor's arm, and one of the larger veins in the elbow region (usually the median cephalic vein) is punctured. A cannula of large diameter is used in order that the blood may flow out rapidly through the needle. The blood is collected in a graduated glass jar which contains at its bottom the two-per-cent citrate solution. If we want to give 450 Cc. of blood, we add 50 Cc. of this solution, thus effecting a two-per-thousand mixture. Smaller and larger amounts of blood are treated proportionately. It is important to take good care that in mixing blood and citrate the proportion is never less than two per thousand. In order to prevent such an occurrence it might be advisable to add a few cubic centimeters of surplus citrate

solution, which can be done with perfect safety.

2. Infusion of the blood into the recipient. The recipient is usually so anemic that it is needful to expose the vein by a small incision in about 80 per cent of the cases. The cannula is inserted, and the latter is attached to a salvarsan apparatus which contains from 20 to 30 Cc. of physiologic sodium chloride solution. The blood is then poured into this apparatus and allowed to run into the punctured vein by gravitation (exactly like an ordinary saline infusion).

The technique of this method is certainly most simple. It has the further advantage that no special apparatus, not even a syringe, is required for its use. A trocar, a piece of rubber tubing, a glass funnel, and a few grammes of sodium citrate represent the whole outfit. We often forget that methods should be applicable not only in large, well-equipped hospitals, but also in any small village. Lewisohn thinks any country practitioner ought to be acquainted with this simple method. Many a life could thus be saved, especially as this method offers the further advantage that the blood can be carried from one place to another. Brem has carried citrated blood 70 miles before he injected it. Burmeister has even gone a step farther and advised the storage of erythrocyte-citrate emulsion for emergency use. There is no doubt that citrated blood can be kept for hours and possibly up to two days, and then injected without harm to the patient. This procedure should, however, be applied only in exceptional cases, as possibly hemolysis and other biologic changes in blood so kept do not make it quite as safe and efficient as blood which is transferred from donor to recipient with a short interval.

A Wassermann test must be made in every donor, particularly the professional ones. Furthermore, the blood of the donor and recipient must be tested in order to prevent hemolysis and agglutination. These tests can be done in a very few hours and ought to be applied, except in cases of grave emergency. The opinion has been expressed by different men that these tests are unnecessary. Rather large series of transfusions without tests have been reported, and the absence of any symptoms of hemolysis has been made use of as proof for this contention. This, however, is misleading. It is perfectly feasible to perform twenty transfusions without tests and without serious accident and to have the twenty-first patient die on account of serious incompatibility of the blood of donor and recipient. Such an accident can be avoided easily by proper laboratory tests. Thus to endanger the life of a patient unnecessarily is foolhardiness.

The following important facts ought to be kept in mind in connection with this question: (1) Donors cannot be used a second time for the same patient without another test as to hemolysis and agglutination. (2) Blood relatives (parents and children, brothers, etc.) have to be tested just as thoroughly as strangers, as their blood often is very incompatible in spite of their near blood relation. Cherry and Langrock have asserted that in new-born infants the mother's blood can always be used with perfect safety for a transfusion. Other workers, however, do not agree with this statement.

THE TREATMENT OF DUODENAL ULCER FROM THE MEDICAL STANDPOINT.

In the *New York Medical Journal* of March 17, 1917, BASTEDO in discussing this subject says that in the main the treatment consists of antacids, demulcents (bismuth and oil), and laxatives—*i.e.*, drugs to combat hyperacidity and hypersensitiveness with pylorospasm, and measures to avoid intestinal stasis. For example, at the outset one might use: (1) Sodium bicarbonate, half a level teaspoonful in half a glass of water between feedings, four to eight times a day. That this sets free gas when in contact with acid has not proven clinically to be a bar to its use. (2) The milk of magnesia, one-half to one ounce with water two ounces, at bedtime, or magnesium oxide, ten grains, mixed with sodium

bicarbonate and given during the day. (3) Bismuth subcarbonate, thirty grains, with a little water three or four times a day. This drug is not astringent, but is demulcent or protective. It may be given every two hours in ten-grain doses, alternating with sodium bicarbonate, or mixed with it. (4) A soap-suds enema daily if needed.

At the end of the second week, for thorough cleansing, castor oil, one ounce, may be employed, or calomel, two grains at night, ¼ grain every quarter-hour, followed next morning by a saline cathartic. After that, or from the beginning, a mineral oil one-half to one ounce may be given two or three times a day. The advantages of the mineral oil are that it tends to decrease acidity and sensitiveness, to relax the pylorus, to soothe the ulcerated area, and to act as a laxative. When the patient is up and about one may allow a nightly dose of phenolphthalein or cascara, or an aloin, belladonna, and strychnine pill. It is not to be expected that a cure can be obtained unless the bowels are kept in good order. Atropine has been much employed to lessen hypersecretion and overcome pylorospasm. Bastedo has experimented much with this drug and believes that it does not have these effects unless it is administered hypodermically and in maximum doses—*i.e.*, doses that will produce dryness of the throat, dilated pupils, or cerebral excitability. These pharmacological actions preclude its frequent use. Chlorosis, but probably no other form of anemia, may be successfully treated by daily hypodermics of 0.5 to 1 Cc. of a ten-per-cent solution of iron and ammonium citrate.

The so-called "empty pain" may be due to hunger contractions, spasm of the pylorus, free hydrochloric acid, or acids of fermentation. If there is fermentation, as in retention cases, this "empty pain" may be present, even though there is plenty of food in the stomach. Any pain from acids is probably due to the induction of hunger contractions, for in six cases of stomach ulcer Hertz gave four ounces of 0.5-per-cent hydrochloric acid with no pain, though this strength of acid hurt when applied to a skin abrasion. He found also that one-per-cent lactic and one-per-cent acetic acids in the stomach caused no pain. If the general treatment with bismuth, alkalies, and bland food is not successful, codeine one grain or atropine sulphate 1/50 by hypodermic may be employed, and a hot-water bag or mustard plaster placed over the stomach region. In some cases it is best to stop all feeding for one or two days, as this results in inhibition of hypersecretion.

If at any time distention is troublesome, one may take measures to open the bowels, may apply a hot-water bag, and give sodium bicarbonate thirty grains with spirit of peppermint five minims or other carminative. For a day or so it may be necessary to feed less often and to omit cereal from the diet. If the stomach is atonic it calls for the administration of strychnine. If the gas is entirely colonic, and especially if it collects in the splenic flexure, it may yield quickly to an enema or colon irrigation; if there is tympanites it may require carminative enemas of turpentine or spirit of peppermint, and the application of hot stupes, a rectal tube being left in the rectum for half an hour or so.

Vomiting is unusual, and arouses suspicion of a gastric ulcer. There is the vomiting of intolerance to food. If this does not yield to the regular ulcer treatment, it demands daily lavage, duodenal feeding, or surgery. There is also the vomiting of hyperacidity, perhaps accompanied by hyperperistalsis. This is usually preceded by the nausea accompanying severe hunger contractions, and it yields to the regular treatment. The vomiting of retention requires lavage and usually a milk-free diet.

In some cases in which a course of a week or two of ulcer diet is unsuccessful in abolishing the pain and other symptoms, or when the ordinary ulcer treatment is followed by recurrence, a course with duodenal feeding may be successful. This may be tried especially when the patient objects strenuously to surgery.

In duodenal ulcer without obstruction the intermittent character of the attacks makes

the patient seem to be cured when he is not. Hence freedom from pain and discomfort obtained by proper treatment does not of necessity mean a cure until time proves it to be permanent.

THE CHARACTER AND MANAGEMENT OF GASTRIC MYASTHENIA.

The *Proctologist and Gastroenterologist* for March, 1917, contains an article by AUSTIN in which he expresses the belief that one of the most important factors in the treatment of gastric myasthenia is the diet and manner of preparation of the food. While it has been demonstrated that the motility is not impaired, still personal experience soon shows every physician that a large meal causes more or less discomfort, not only during the period of its digestion, but frequently for two or three following days until conditions are restored. This is unquestionably due to the overdistention of the weakened muscular coats, which requires the stated period to be overcome; hence we are restricted to five small meals rather than the three usual ones to which the American public is accustomed. In no form of gastric disorder is the necessity for slow eating and thorough mastication more evident than in these cases which Austin describes. Rapid eating, undoubtedly, increases the amount of air which enters the stomach and still further aggravates the condition of atonia. Food, too, must be of the most concentrated character, and soups, large quantities of milk, and other liquid food must be avoided. The supreme folly of directing such patients to take two or three quarts of milk a day is self-evident. In fact, experimentation has shown that the dry meal, by exciting the secretion of a greater quantity of gastric juice, or possibly the diluting fluid from the antrum, soon induces the gastric content to assume its normal concentration; hence the great discomfort experienced when these large quantities of fluid are taken points out the dry diet as the most satisfactory to be employed. Therefore, it is most desirable that the patient be urged to refrain utterly from fluid with the meal and wait at least half an hour before the customary cup of tea, coffee, or cocoa is taken. All effervescent drinks, Vichy, White Rock, and particularly beer, are an abomination under these conditions, since they exaggerate the pathological condition which we are trying to overcome.

The density and viscidity of the gastric contents withdrawn also point to another aid in digestion, and that is the finer comminution of all foods that are taken. If the teeth are impaired, as so frequently happens, artificial means, such as mashing all vegetables and chopping all meats which can be done by the patient with knife and fork, or better still, with the Enterprise meat cutter, are very essential. There is no reason why the ration should not be a well-balanced one, consisting of an appropriate quantity of starch, protein, and fat, though it has appeared to Austin that the fat portion of meat, and especially meat which is inherently fatty, like pork, etc., should be avoided. Those vegetables, too, which contain a large amount of cellulose, such as turnip, celery, cabbage, and cucumber, must be avoided. Fats should be restricted to cream and butter, not too salty, and the employment of sweet oil can be recommended. Fruits are advisable, particularly in their cooked state, but seed and skins are to be rejected. In regard to the use of sweets, there is much variation in their effects on different patients. Lump sugar and chocolate caramels, without the customary ingredients of nuts and figs, have been used by Austin in certain cases to great advantage, while in others complaint is made that they either produce a burning sensation or sometimes increase the eructations.

One thing, however, is most essential, and that is that the patient should receive a diet of full caloric value, since in the majority of cases they are undernourished and increased nutrition is often the most successful form of treatment. This can be accomplished only by specifying the amount as well as the character of the food which should be employed. On account of the constant tendency to constipation, coarse breakfast foods, like wheat grits, wheatena,

and shredded wheat, are desirable, though occasionally patients are found who have to eschew their employment, because of increased discomfort from their use.

As many of these patients suffer from insomnia, it is often desirable to recommend a light meal just before bedtime, which may consist either of a sandwich made with cream cheese or a cup custard, both of which are readily disposed of and do not increase the gastric discomfort.

Tea, coffee, and cocoa, under the restrictions mentioned above, can be employed, but coffee particularly should be taken only with cream, never with sugar, since the consensus of opinion among patients is that coffee produces distress when taken as is customary with both milk and sugar.

Of all green vegetables, finely chopped spinach has seemed to be most desirably adapted to this state of atonia, aiding and facilitating the action of the bowels and apparently not increasing the tendency to eructations. The employment of baths for this condition has proved very efficacious in Austin's hands. We may either use the cold sponge over the abdomen, followed by brisk rubbing, or what is better still, the bath spray, either arranged to deliver cold water alone, which should be directed upon the epigastrium and continued for a period of three to five minutes, or one arranged to deliver cold and hot water, such as can readily be adjusted to the two faucets of the bath tub. In this case, we can either temper the water so that at first it is tepid, and then the temperature may be lowered until cold water alone is delivered at the nozzle; or we may employ the Scottish douche, by which alternately hot and cold water is employed, finishing always with the spray of cold water. Then, again, many individuals, on account of the associated nervous condition, as it is called by them, are benefited by the cold plunge. This can be introduced, first, by filling the bath-tub the evening before and allowing the chill of the water to become partially dissipated, when after being somewhat accustomed to it the patients will readily plunge into the freshly drawn cold water of the tub. The invigorating effect of this bath upon the myasthenic stomach is indicated by the fact that the appetite for the breakfast is improved and very little discomfort is experienced after that meal. In Austin's opinion, this form of treatment should be employed in the early morning, directly after the individual has aroused from sleep. Such baths should never continue beyond a period of five minutes or, if the plunge is employed, should be almost instantaneous, and then the patient should be wrapped in a blanket or bathrobe until the reaction occurs, which always follows promptly in all but the extremely anemic.

EFFECTS OF TONSIL OPERATIONS IN SINGERS—AN ANALYSIS OF 5000 CASES.

The *New York State Journal of Medicine* for March, 1917, contains an article by VOORHEES bearing this title. He thinks that there is no doubt that in certain selected cases it is better to temporize than to do a radical operation. Special considerations which cannot be entered into at length here afford the basis of such judgment. It is occasionally better to do a tonsillectomy and treat the cryptic stumps by introducing a bead of chromic acid or the electrocautery point. This especially in the very large tonsil, which holds the two pillars in an apparent state of tension. The small, cheesy tonsil should be removed *en masse*, as nothing is to be gained by simply puttering with it. The sooner it is out the better. In conclusion:

1. An analysis of 5000 tonsil operations in singers shows that in the hands of skilled operators there need be no special fear of bad results.

2. It is the consensus of opinion that bad results are most often due to cicatricial contractions occurring from careless dissection or from neglected after-treatment.

3. Pain in the tonsillar region, neck and larynx is probably due to section of some of the larger branches of the glossopharyngeal nerve (Justus Matthews).

4. Loss of singing voice occurs very

rarely after tonsillectomy, if at all. Impaired voice is possible, but most cases show an increased range of from one-half to a full tone.

5. Loss of singing voice after tonsillectomy might be due to a nerve lesion, but is probably due to adhesions and cicatricial formations in the fauces.

6. The singer's problem is a very special one, and no laryngologist should undertake to operate on these patients unless he has some knowledge of the art of singing.

7. At operation the greatest care and skill must be exercised in securing a clean, free dissection. Injury to the tissues surrounding the tonsils may prove disastrous.

8. Postoperative care is of special importance. The patient should be seen daily until full healing ensues.

ZINC CHLORDE IN UTERINE HEMORRHAGE.

The *Journal of the American Medical Association* of March 17, 1917, contains an article by BOLDT in which he says that it seems too radical, in his opinion, to subject a patient who has a very profuse bleeding, in the form either of menorrhagia or metrorrhagia, the uterus not being the seat of a neoplasm, to an extirpation of the uterus. He, therefore, commenced to experiment with varying strengths of phenol applied within the uterus. In mild cases this sometimes gave a good result. Then he began to make his applications of longer duration by leaving in a gauze strip—a tampon saturated with the medicament in that part of the gauze which was to remain in contact with the corporal endometrium. This was done by wrapping an intra-uterine applicator syringe, such as is made according to Boldt's directions by the Kny-Scheerer Company and Tiemann & Company. The medicament is drawn into the small barrel of the syringe, and this is wrapped with a narrow strip of gauze. The cannula of the syringe is made of silver, from 4 to 5 inches long, with only a terminal opening, so that the medicament comes into contact with the endometrium from the fundus downward. To allow of the gauze being readily slipped off, the cannula should be smeared with petrolatum before the wrapping. The strip should be from 1 to 2 inches wide, and the length should vary with the size of the uterine cavity, usually from 12 to 24 inches. When the gauze-wrapped cannula has been introduced into the uterine cavity, a small quantity of the medicament, 4 or 5 drops (if zinc chloride), is expelled into the gauze. Then the cannula is withdrawn slightly and, being used as a uterine packer, more gauze is put into the uterine cavity and more of the medicament is ejected. This process is continued until the desired quantity has been ejected into the gauze and the cavity packed properly. When enough medicament has been put into the gauze, the cannula may be entirely withdrawn and the remaining part of the gauze packed into the uterine cavity with an ordinary smooth uterine applicator. It is essential that none of the medicament should come in contact with the cervical mucosa, especially if zinc chloride is used, lest a stricture result. The remaining part of the non-medicated gauze strip is then used to pack tightly the cervical canal. It is frequently necessary to dilate the cervical canal with a cervical dilator to assure a ready packing with the gauze.

A string should be attached to the terminal part of the gauze strip to enable the patient to remove it herself at the time designated for its removal. A fairly large absorbent cotton tampon is placed in the vagina after insertion of the gauze. The time of removal of the intra-uterine tampon depends on whether zinc chloride or phenol has been used. If phenol, either pure or diluted with glycerin, is the medicament, the gauze strip may be removed after the lapse of a few hours. But if zinc chloride, the time to elapse must be long enough to give it an opportunity to exert its action on the interior of the uterus, which is about three days. In case of severe abdominal pain, which may occasionally occur, one-fourth grain of morphine is sufficient to give relief. It is very important, to insure proper action of the medicament, that the interior of the

uterus is practically dry; that is, that no bleeding from it occurs when the application is made. When there is blood oozing, the packing of the cavity with styptic gauze for a variable time is the best method to overcome it.

Unless permanent amenorrhea is desired, not more than from 5 to 10 drops of the strong solution (50 per cent), or a somewhat larger quantity of a 10- to 20-per-cent solution, should be used.

It has been found that one application of zinc chloride, if properly made, once in four weeks, usually suffices. This is to be repeated, at such intervals, until the wished-for result has been brought about. From four to twelve applications generally suffice. With twelve applications, or even a less number, it has been found possible to effect complete amenorrhea in very profuse bleeding from interstitial myomas. Some of these tumors, in Boldt's experience, were fully 6 inches in diameter. While they did not decrease in size, the symptoms disappeared and the patients improved in health. Since the bleeding stopped, this was logical.

Zinc chloride is made use of when the uterine bleeding is very profuse from a chronic inflammatory condition of the endometrium, whether the myometrium is involved or not. If the bleeding is not too profuse or too prolonged, phenol suffices to bring about relief. Zinc chloride is always used in instances of profuse bleeding when interstitial myomas of small size cause it. In large tumors of this character Boldt has not used it, nor would he advise its use, because, in such cases, he feels that it is more to the interest of the patient, if one does not wish to use radium or roentgenotherapy, to remove the tumor. By the latter statement he does not wish to be understood as favoring roentgenotherapy in these conditions, since he himself has seen instances of cancer complicating the tumor.

It is understood, of course, that one should always be sure, before using this treatment, that the bleeding is not caused by a malignant change of the endometrium.

This is a form of treatment which may be used in his office by an intelligent physician who understands gynecologic diagnosis; even the sometimes necessary cervical dilatation, to introduce the gauze-wrapped cannula, may be done. Seldom has Boldt found it necessary to do this, under gas-oxygen anesthesia, in a hospital.

RECIPES FOR KILLING FLIES.

The *Pennsylvania Medical Journal* for May, 1917, states that the United States government makes the following suggestion for the destruction of house-flies: Formaldehyde and sodium salicylate are the two best fly poisons. Both are superior to arsenic. They have their advantages for household use. They are not a poison to children, they are convenient to handle, their dilutions are simple, and they attract the flies.

A formaldehyde solution of approximately the correct strength may be made by adding 3 teaspoonfuls of the commercial formaldehyde solution to a pint of water. Similarly, the proper concentration of sodium salicylate may be obtained by dissolving 3 teaspoonfuls of the pure chemical (a powder) to a pint of water.

An ordinary, thin-walled drinking glass is filled or partially filled with the solution. A saucer, or small plate, in which is placed a piece of white blotting-paper cut the size of the dish, is put bottom up over the glass. The whole is then quickly inverted, a match placed under the edge of the glass, and the container is ready for use. As the solution dries out of the saucer and the liquid seal at the edge of the glass is broken more liquid flows into the lower receptacle. Thus the paper is always kept moist.

Any odor pleasing to man is offensive to the fly, and *vice versa*, and will drive them away.

Take five cents' worth of oil of lavender, mix it with the same quantity of water, put it in a common glass atomizer, and spray it around the room where flies are. In the dining-room spray it lavishly even on the table linen. The odor is very disagreeable to flies and refreshing to most people.

Geranium, mignonette, heliotrope, and

white clover are offensive to flies. They especially dislike the odor of honeysuckle and hop blossoms.

According to a French scientist flies have intense hatred for the color blue. Rooms decorated in blue will help to keep out the flies.

Mix together one tablespoonful of cream, one of ground black pepper, and one of brown sugar. This mixture is poisonous to flies. Put in a saucer, darken the room except one window, and in that set the saucer.

To clear the house of flies, burn pyrethrum powder. This stupefies the flies, but they must be swept up and burned.

TRANSFUSION OF BLOOD.

In the *Bulletin of the Johns Hopkins Hospital* for March, 1917, McCLURE and DUNN remind us that transfusion has been tried in the following conditions: pernicious anemia, illuminating-gas poisoning, exophthalmic goitre, hemophilia, toxemia, shock, hemorrhage, leukemia, septicemia, purpura hemorrhagica, malnutrition, endocarditis, intoxication, general debility, dysentery, typhoid fever, infectious diseases, melena neonatorum, scarlet fever, pellagra, tuberculosis, and tumors. It has also been used for vaccinating purposes.

The best results have been obtained in hemophiliacs and babies with melena neonatorum; in the latter it is a specific, and in the former it stops the bleeding immediately, although without curing the disease. It is of great benefit in all anemias, and with proper regulation may be of still more benefit in the primary types. Thus far in shock it has been disappointing. This may very well be due to the fact that the shock has progressed too far before the transfusion has been done. They would advise a very early transfusion in cases of shock.

Following acute and prolonged hemorrhages transfusion is of the greatest benefit. For gas poisoning, bleeding is beneficial, as was pointed out by Halsted. Depletion followed by injections of saline solution is as good as if not better than transfusion. In tuberculosis there has been only slight benefit, and so far nothing has been accomplished by transfusion in malignant diseases in man.

TREATMENT OF PAIN AND DISTRESS IN DIGESTIVE DISORDERS.

In the *Boston Medical and Surgical Journal* of March 8, 1917, AUSTIN tells us that the treatment of cardiospasm naturally divides itself into two parts. The first, when functional, is prevention, which comprises the following suggestions: The patient must avoid rapid eating and particularly drinking, because of the great risk of causing an attack when much air is introduced into the stomach. An excellent plan to follow in taking fluids has been found to be the use of a tablespoon, by which necessarily only a small portion enters the esophagus at one time. Many suggestions can be offered also with the purport to stop the wolfing or bolting of food; laying down the knife and fork after every mouthful will tend to check this haste and cause better mastication, while a watch laid before the individual will soon convince him of the rapidity with which he is devouring his food. No iced drinks nor foods should be taken, since these, too, tend to bring on an attack of the spasmodic closure of the cardia. All efforts to overcome the spasm by eructations must be avoided, since usually more air is introduced into the esophagus than escapes. Constipation must be controlled, as apparently, by reflex activity, it predisposes toward such spasm. Smoking and aerated drinks are also known to encourage these attacks and consequently must be given up.

During an acute attack the suffering varies from mild pain, which the patient usually localizes in the precordial area and considers due to a heart attack, sometimes termed pseudo-angina, to a most incessant suffering, reminding one often of an attack of gall-stone colic. For the severer attacks nothing works with the rapidity and efficacy of the hypodermic injection of morphine, since our only object is to relax the spasm.

Less severe attacks can usually be overcome by means of the carminatives, such as a half teaspoonful of equal parts of spirit of chloroform and compound tincture of cardamom, or the latter with aromatic spirit of ammonia, given in hot water, either sipped or taken with a tablespoon. The old and well-established remedy, Jamaica ginger, taken in hot water, will usually relax the milder forms of spasm. Where the patient's pocketbook permits, validol or menthyl valerianate serves the purpose admirably.

On the contrary, when this spasm is the outcome of an ulcer situated at or near the cardia, the patient should be subjected to a regular ulcer diet, as originated by Lenhartz and modified by as many practitioners as have ever used it. Where the attacks are of functional character, the choice of food has seemed to Austin of very little importance, provided the suggestions made above are followed; but when actually due to ulcer, a most rigid selection of bland, non-irritating food must be made to check possible irritation.

The management of distress after food is taken, usually arising from myasthenia, is one of the most trying problems presented to the physician. As this apparently arises from any distention of the stomach, our object is to provide the patient with sufficient nourishment and to render his discomfort during the period of its digestion as little as possible. To do this, we must advise small, frequent meals with little or no fluid; hence soups and large quantities of milk are absolutely inadvisable, and the food should always be taken dry. Fluids may be taken, of course, but in the intervals between meals so as to avoid overdistention. Moreover, the more finely divided the food may be, the more readily it leaves the stomach and the less the period of discomfort. Fats, too, are known to delay the motility of the stomach or, at least, leave it very slowly, so that, outside of cream and butter, they should be eliminated from the dietary. Patients, too, from their personal sensations, declare that meat causes them much more discomfort than any other form of food, and the more extensive employment of eggs, soft cheese, and gelatin to supply the protein deficit should be advised. Our efforts should be directed to lessen the discomfort as much as possible and to increase the gastric motility. The former can be accomplished frequently by the use of bromides, which may be employed in gramme doses after the food is taken, or in the employment of anesthesin, which, while not sufficiently active to delay acute pain, does relieve very much the patient's discomfort when taken in doses of 0.3 gramme after the meal. Anesthesin is also prepared in the form of bonbons, which make a very desirable vehicle for its use.

Pyloric spasm with late post-cecal or early morning pain can be alleviated or controlled both by dietetic and medicinal means. The former consists largely of the total avoidance of coffee or condiments as well as alcohol on an empty stomach. As this condition is frequently accompanied and possibly caused by hypersecretion, though the evidence of the latter is not positive, we should also advise patients to have in their possession some of the heavier alkalies, like bismuth or magnesia; the former to be employed if there is a tendency to diarrhea, and the latter if the patient is prone to constipation. These substances are rather disagreeable to take, and in Austin's own experience the preparations known respectively as "milk of bismuth" and "milk of magnesia" are the most palatable and readily taken. Their only disadvantage is that the amount of material in suspension is small, not exceeding five grains per teaspoonful.

The oils also prove efficacious when taken during the attack or sometimes before the meal, and sweet oil furnishes, perhaps, the most satisfactory of these, though liquid petrolatum in tablespoonful doses is very effective in checking the spasm as well as having a mild laxative action. Usually, however, we are compelled to resort to certain drugs to overcome this spasmodic action or "cramp" as the patients term it, and nothing better has been found than atropine sulphate in 1 mgm. doses three times a day, taken after the food. On

account of the unfortunate susceptibility of some individuals to this medicament, by which the throat becomes dry and the pupils dilated, interfering with the vision, one must inform the patient of these peculiarities or else much alarm is aroused. To overcome this we may employ methyl atropine nitrate or eumydrin, its trade name, in doses slightly larger than those of atropine itself, but never exceeding 2 mgm., three times a day.

CASES OF PELLAGRA TREATED IN 1916.

RAINES in the *Memphis Medical Monthly* of February 1, 1917, again insists upon a diagnosis before skin symptoms appear. He thinks that if we hope for the best results we should not wait for a positive diagnosis, but begin treatment if there is a reasonable doubt in favor of the patient having pellagra.

He has seen a number of cases in his immediate neighborhood this year in which the opportune time for treatment was lost. One case was a woman who was moribund when first seen. The woman had been treated for tuberculosis. Valuable time had been lost and she died within five days.

He considers a patient "cured" when there are no manifestations of pellagra, the diarrhea, indigestion and sore mouth having disappeared, with no appearance of skin lesions, and, he might add, when the patient is able to go about his usual avocation and strong enough to perform manual labor.

Emetine is given in all cases in which the diarrhea is persistent, and particularly if there is blood in the passages. The emetine hydrochloride is given in one-grain doses every other day or until the abnormal discharges cease. Frequently one dose is sufficient to stop the diarrhea.

One case of amebic dysentery was treated, in which the man said he "had suffered many things from many doctors" for seven years. He has gained thirty pounds in weight and has not lost a day from work.

Raines "treats the patient, not the disease," and gives him whatever he needs when he needs it. For the insomnia veronal is preferred; for the restlessness, nervousness, and despondency the elixir of five bromides is given, combined with chloral hydrate when needed.

It is claimed that the best results are obtained early in the disease when large doses are given, whereas small doses are to be preferred in advanced cases. He rarely gets the cases to treat until they have had the disease several months, consequently he is afraid to administer large doses in the beginning.

One man was given a 7¾-grain dose, and before Raines could replace his syringe he fell on the bed. He was pulseless, his breathing laborious, and Raines had to get busy to keep from recording another death from pellagra.

Another case, that of a vigorous young woman, was given a 7¾-grain dose at Raines's office. In less than one minute another patient called to him from the reception room, saying, "Come in here quick; this woman has fallen over on the sofa and is bleeding from the nose."

Raines does not claim that cacodylate of soda is a true specific for pellagra, but after four years' experience with the drug he can say that it has far exceeded his expectations.

He has had no experience with salvarsan and very little with atoxyl in the medical treatment of pellagra, preferring to "bear the ills we have than fly to others we know not of." Besides, the cost would make such treatment prohibitive in general practice, where the financial condition of the patient must be considered.

He gives a good, liberal diet—in fact, all the patient's digestion will stand. He prohibits fat meat, corn bread, and much sweets. He sees no reason for prohibiting a moderate use of sweets, particularly if they do not upset the stomach and bowels. If good meal is procurable he sees no reason why the well should not eat it as a prophylactic and the sick because they want it. By good meal he means sound corn, the ears "nubbed" at both ends, and ground on a slow mill.

THE THERAPEUTIC ADMINISTRATION OF OXYGEN.

The *British Medical Journal* of February 10, 1917, contains an article by HALDANE in which he thoroughly discusses this topic and emphasizes the fact that a physician ought to make every effort to avert the effects of want of oxygen or cut them short. It may be argued that such measures as the administration of oxygen are at the best only palliative and are of no real use, since they do not remove the cause of the pathological condition. As a physiologist, he cannot for a moment agree with this reasoning. The living body is no machine, but an organism constantly tending to maintain or revert to the normal, and the respite afforded by such measures as the temporary administration of oxygen is not wasted, but utilized for recuperation.

Let us now consider in more detail how oxygen want is produced, what seems to be possible in directly combating it by oxygen administration, and what risks have to be avoided. We may begin with a simple and easily intelligible case—that of poisoning by CO, or by a nitrate, chlorate, or other poison which causes death by disabling the oxygen-carrying power of the blood. In such a case acute want of oxygen is produced by the poison disabling the hemoglobin, so that it is unable for the time to carry sufficient oxygen to support life. Normal human arterial blood carries about 18.1 Cc. of available oxygen per 100 Cc. of blood. Of this, about 17.75 Cc. are combined with the hemoglobin and 0.35 Cc. is in simple solution. In passing round the circulation during rest this blood loses only about 4.5 Cc. of oxygen. In poisoning by CO and similar respiratory poisons, death occurs when about 80 per cent of the hemoglobin is disabled. If the patient is still alive there will, therefore, still be 20 per cent of his hemoglobin available. But by administering pure oxygen we can at once increase the amount of oxygen in simple solution to about 2.5 Cc. This promptly averts any further danger from want of oxygen, and in CO poisoning the oxygen rapidly drives out CO from the hemoglobin, so that after fifteen or twenty minutes of continuous administration the oxygen may be discontinued. In poisoning by nitrites, etc., there is also a fairly rapid return of the blood towards the normal, consequent on the gradual elimination or destruction of the poison. Experiments on animals have shown quite clearly that oxygen actually does avert death in the cases just considered.

In acute inflammatory conditions of the lungs there is sometimes also want of oxygen, as shown by cyanosis; and where the inflammatory condition is accompanied by the presence of "edematous" exudation throughout the lungs the cyanosis is often very great. This condition is seen typically in the acute stages of poisoning by nitrous fumes or chlorine. What is its probable cause? When a portion of the lungs, including even the greater part of both lungs, is entirely blocked by consolidation, as in croupous pneumonia, there is commonly no cyanosis. This indicates that very little blood is passing through the consolidated parts. What passes through the healthy portion is amply sufficient for respiratory requirements during rest. It must be borne in mind that the normal lungs and circulatory organs are adapted for meeting about ten times the respiratory requirements during rest, since the respiratory change is often about ten times as great during work as during rest. Hence during rest in bed a very small proportion of normal lung will suffice for meeting respiratory and circulatory requirements, provided there is but little circulation through parts which are useless. But when cyanosis due to a lung affection exists, in spite of the fact that air is entering the whole or a great part of the lungs, freely, we seem driven to the conclusion that the entry of oxygen into the blood through the alveolar walls is impeded by exudation and increase in thickness of the alveolar walls.

It is very important to realize that this may occur without any serious impediment to the passage of the CO_2 outwards. CO_2 is about twenty-five times as soluble in water as oxygen, and hence it passes

through the alveolar walls far more easily, with a given difference of partial pressure, than does oxygen. Moreover, a comparatively slight increase in the breathing will enormously increase the small difference in diffusion pressure on which the passage of CO_2 outward depends; but the same increase in breathing produces only a slight proportional increase in the diffusion on pressure which drives oxygen inward. Hence we may have cyanosis, and consequently very formidable effects from oxygen want, without marked hyperpnea. The gray look of the patient's face will be a good index of this. There will probably be no increase of venous blood-pressure with its accompanying full blue cyanosis.

If great hyperpnea accompanies the cyanosis there must be some other complicating condition. This accompaniment is seen typically in the acute stage of poisoning by chlorine or nitrous fumes; and the results of post-mortem together with clinical observation during the recovery stage seem to reveal the cause. In the acute stage the alveolar walls become extensively torn in efforts to breathe despite the blocking of many of the bronchi by exudation or constriction. In consequence of this there is wide-spread emphysema, which is very evident on post-mortem examination. The areas round the emphysematous cavities are partially collapsed and very imperfectly ventilated, so that the CO_2 percentage rises in them to an abnormal extent. The emphysematous cavities are excessively ventilated, but this ventilation is of little use since the proportion of sound alveolar wall to air is far too small. In consequence of this the CO_2 content of the arterial blood is raised, and hyperpnea, along with increased arterial and venous blood-pressure, results. As the edema clears up the cyanosis disappears, but hyperpnea remains for some days, since it takes a considerable time for the emphysema to heal up.

When there is cyanosis (whether of the deep purple or gray type) due to hindered passage of oxygen through the alveolar walls, this can be combated by raising the percentage of oxygen in the alveolar air and so increasing the diffusion pressure. The normal alveolar oxygen percentage is about 14, or 7 per cent less than in the external air. By raising the percentage of oxygen in the inspired air to 35 we raise the alveolar oxygen percentage to 28, and thus much more than double the effective diffusion present, since the oxygen pressure in the venous blood passing to the lungs will probably be at least 4 per cent. It will probably, therefore, require only a moderate increase in the oxygen percentage of the inspired air to remove the cyanosis. Even in ordinary cases of croupous pneumonia the alveolar oxygen pressure may be a matter of decisive importance. This is clearly shown by the fact that these pneumonias do very badly at high altitudes. At Cripple Creek (altitude about 10,000 feet), in the Rocky Mountains, Haldane found that this was so well recognized that all cases of pneumonia were put in the train and sent down to the prairie level.

Where, in lung affections, an addition of oxygen to the inspired air is needed in order to combat want of oxygen, it is evidently desirable to continue the administration over long periods. It was shown by Paul Bert that oxygen at a pressure of about three atmospheres is capable of producing convulsions and rapid death; but Lorrain Smith found that, apart altogether from this action on the nervous system, pure oxygen at high pressure produces pneumonia pretty rapidly, and even at ordinary atmospheric pressure acts slowly on the lungs, ultimately producing fatal pneumonia after several days in animals. This effect was even occasionally produced in about four days by a mixture containing only 80 per cent of oxygen. It is evidently desirable, therefore, to keep the oxygen percentage as low as possible during long administrations, and to know roughly what percentage is being breathed.

In cases in which the source of danger is failure of the circulation, the inhalation of oxygen may also be of use, and Haldane has seen the cyanosis in a case of valvular disease clear up at once on the administration of oxygen. The effect was so striking

that it could hardly be attributed to the increased amount of oxygen going into simple physical solution in the arterial blood. It seemed more probable that owing to back pressure in the lungs and consequent exudation, etc., there was hindrance to the diffusion of oxygen inward, and that with the increased oxygen percentage this was overcome. Nothing but practical trial, for which he has at present few opportunities, will show to what extent, and under what conditions, the administration of oxygen is of use in various pulmonary and cardiac affections. Cyanosis may always be taken as an indication that oxygen inhalation should be considered.

The immediate effect of suddenly giving an abundance of oxygen to a cyanosed person may sometimes be unpleasant, as he well knows from experiments on himself and others. The heart may become tumultuous in its action, and the breathing irregular for the time, or the patient may wake up to the realization of pain or discomfort. His respiratory center may also wake up to reaction against accumulated CO_2. It is well, therefore, not to add oxygen too rapidly to the inspired air in cases of cyanosis.

Existing methods of giving oxygen are nearly always very crude and wasteful of oxygen, and it is not possible to graduate efficiently the percentage of oxygen administered. The simple apparatus now to be described is designed to remedy these defects and render practically possible the prolonged administration of air enriched with as little oxygen as will suffice for the purpose aimed at.

An ordinary 20-foot oxygen cylinder is fitted with a pressure gauge and adjustable governor of the type employed in mine-rescue apparatus. By means of the governor the delivery of oxygen can be varied at will from nothing to 10 liters a minute. The oxygen is delivered into a small bag of thin vulcanized rubber of about 2 liters capacity. From this bag there passes to a face-piece on the patient a flexible tube of about five-eighths of an inch in diameter. At its origin from the bag this tube is provided with a non-return mica valve. The last part of this tube is of light and perfectly flexible corrugated rubber tubing of the kind introduced by Mr. Fleuss for mine-rescue apparatus. The face-piece is of the ordinary type, fitting over the mouth and nose, but so designed as to leave a minimum of dead space when applied to the face. It can be secured in position by an elastic strap. Besides an inlet for oxygen, the face-piece has inlet and outlet valves for air, so that if no oxygen is turned on the patient can breathe the air comfortably and freely. Some air will also leak in and out round the face-piece, which need not be at all tightly applied.

When oxygen is turned on it accumulates in the small bag during expiration, since the very slight expiratory pressure in the face-piece closes the non-return valve, and this prevents the issue of oxygen from the bag, and, of course, at the same time prevents expired air from entering the bag. During inspiration the bag is emptied, the oxygen passed into the face-piece and thence into the patient's lungs. If only a little oxygen is turned on the patient will be breathing mostly air, but by turning on more oxygen the proportion of oxygen can be increased till nothing but pure oxygen is being inspired, and the bag does not completely collapse till the very end of inspiration. Thus no oxygen is wasted, and enormous economy of oxygen results so that prolonged administration of oxygen becomes practicable.

Where prolonged administration of oxygen seems desirable, the minimum quantity of oxygen which will remove the cyanosis should be carefully ascertained by observation of the patient, and the governor adjusted to give this minimum quantity, which is likely to be anything from 1 to 3 liters per minute. The quantity needed will of course depend on the weight and age of the patient; and if hyperpnea due to CO_2 is present, a larger quantity will be needed to reach a given percentage. A man at rest usually breathes about 7 liters of air a minute.

The probable risks of prolonged admin-

istration of pure oxygen must be borne in mind, and if necessary balanced against the risks of allowing the oxygen want to continue. No fixed rule can be given. The proper course to pursue must be determined by the physician after careful observation of the patient and in the light of experience and knowledge. Many points with regard to the utility of oxygen administration are still obscure, owing to the haphazard methods hitherto used in the administration of oxygen.

THE COAGULATION OF COW'S MILK IN THE HUMAN STOMACH.

In the *Archives of Pediatrics* for February, 1917, BRENNEMANN reaches these conclusions as the result of a research:

1. Cow's milk coagulates in the human stomach within a few minutes. The small curds formed at first increase in size, for about two hours, by coalescing with their neighbors, after which they decrease because of the peripheral digestive action of the gastric juice, but are still present after five hours.

2. The curds of raw milk are very large and hard, and those of boiled milk small and soft; those of pasteurized milk between these, but almost like those of raw milk; *i.e.*, raw milk is a very solid food—boiled milk a semiliquid food.

3. The less the fat in the milk the harder and larger the curd; the more the fat, the smaller and softer the curd.

4. The greater the amount of fat the longer the stay in the stomach, and the slower the digestion.

5. Milk taken very slowly forms a larger curd than when taken rapidly.

6. The greater the dilution with water the finer, flakier, and more porous the curd.

7. Alkalies and sodium salts very greatly inhibit coagulation—even stop it completely if in sufficient amounts.

8. Precoagulated milk, such as buttermilk, pegnin milk, or eiweissmilch, shows very little tendency to recoagulation.

9. Dried and condensed milks, as a rule, form a minimum curd.

10. Starchy decoctions, such as barley-water, have a very decided influence in lessening the size of the curd, much more so than simple watery dilution.

11. Soluble carbohydrates, such as dextrins and sugars (milk, cane, and malt) have apparently no appreciable influence on the curd.

THE PLACENTA AS A GALACTAGOGUE.

In the *Gazzetta Italiana delle Levatrici* for July, 1916, TERESA BIANCHINI reports five cases of placentophagy which came under her notice in the Italian marches. The afterbirth was taken to increase the secretion of milk, which in all the women had failed without obvious cause after previous confinements. The placenta was cut up and washed, cooked in salt water, except in one case, in which broth was used for the purpose, and eaten mostly in large pieces. Except for the cooking the method of administration was practically that naturally followed by some animals—for instance, the bitch, which swallows its own afterbirth immediately after expulsion. The treatment is said to have been successful after other methods of stimulating the milk secretion had failed. The placenta was used in antiquity and in the middle ages as a remedy in difficult labor, and in our own day the human afterbirth and that of the sow has been used in extracts given in pills and other vehicles to stimulate the mammary function. In all parts of the world there are many places where the women still hold by the old tradition. In Morocco it is believed that eating the placenta prevents barrenness and hastens delivery. Preparations of the placenta hold a considerable place in Chinese therapeutics. It is regarded as the best remedy for chlorosis and is useful in cases of anemia following parturition. It is thought to be most efficacious when taken fresh, but it is also given dried and in pills. Madame Louise Toussaint, a French midwife, quoted by Cabanés in his Remèdes d'autrefois (Paris, 1905), speaking of women in labor, says: "Notwithstanding the disgusted protests which will come to the lips of many of you, O accoucheurs and midwives, in reading

me, give them, believe me, some fragments of their own placenta and you will tell me what happens. You will see how much you will in this way promote rapid recovery and with what abundance and rapidity the milk will come on. Do not forget that even in non-pregnant women and in virgins the milk secretion may be made to appear by simple placenta feeding." The same woman observer affirms, from her own experience, that there is nothing like the injection of sheep's placenta, dried and then triturated with powdered sugar, for making the milk come abundantly in women who had none, and also for doubling the daily output in nurses. Cabanés tells us that at the fourth French Congress of Internal Medicine, held at Montpellier in April, 1898, Dr. Iscovesco presented a communication on the therapeutic action of the placenta illustrated by more than a hundred cases. He used sheep's placenta in tablets, each representing 0.25 gramme of the fresh substance; the daily dose never exceeded 1.50 grammes. This seemed to have a favorable effect on the secretion of milk. The treatment was also said to have brought about remarkable improvement in chronic metritis with hypertrophy of the uterus and concomitant catarrh even when the appendages were diseased, and in cases of abnormal involution of the womb after delivery.—*British Medical Journal,* Feb. 10, 1917.

THE TREATMENT OF MALARIA AND MALARIAL COMA BY INTRAVENOUS INJECTION OF QUININE URETHANE.

Richet and Griffin in the *British Medical Journal* of February 10, 1917, say that the cases of malaria that reached their hospital from Salonica were of a severe type; in all anemia, loss of weight, and exhaustion were marked; there were rigors in which the temperature reached 107.8°. Most of the men had received numerous intramuscular injections of quinine, some as many as ten or twelve, and all had been treated with quinine by the mouth. In the severe cases quinine by the mouth and intramuscularly had little effect in controlling the fever or the recurrence of rigors.

The type of cases in which the patient passed into a state of coma in twenty-four hours was new to most of them. The men were usually markedly anemic and wasted, but the temperature rarely exceeded 102°. Quite suddenly the patient would complain that he had difficulty in swallowing, rapidly followed by inability to speak, loss of power in the limbs, coma, and incontinence of urine and feces. The pupils were dilated, reacting sluggishly to light, pulse feeble and quick, and respiration resembled the Cheyne Stokes characteristic. The spleen was enlarged and tender, knee-jerks diminished, Babinski's sign was absent, and there was no ankle clonus. Examination of the blood showed the presence of numerous gametes and schizontes.

These symptoms all came on within twenty-four hours, and it was for this type of case that intravenous injection of quinine urethane was first tried.

The injection was made with a fine needle mounted on an ordinary serum syringe of 15-Cc. capacity, and the solution was made up as follows:

> Chlorhydrate of quinine, 0.40;
> Urethane, 0.20;
> Distilled water, 1 Cc.

To this solution in the syringe was added 14 Cc. of physiological serum well warmed. The skin was sterilized with tincture of iodine and alcohol and a bandage applied above the elbow to render the veins more prominent. When the needle enters the vein blood will flow back into the syringe, and this sign will prevent the solution being injected into the tissues. Remove the bandage and inject the solution very slowly; conscious patients notice a bitter taste in the mouth, buzzing in the ears, and slight giddiness within a minute.

The results in cases of coma were remarkable. In five hours the patient became more conscious, and in periods varying from twelve to twenty-four hours he had recovered completely and all symptoms had disappeared.

For some cases one injection was sufficient, and for weeks after there was no further rise of temperature; other cases were given a second injection within twelve hours if the return to consciousness appeared slow.

In no case had the injection any ill effect; only one patient in a series of seventy cases had slight thrombosis of a vein for a few days. Within twelve hours of the injection Lieutenant Richet found evidence of disintegration in the gametes and schizontes, and it was difficult to find any after forty-eight hours.

Two cases of coma only proved fatal, both complicated by dysentery. Each case had two attacks of coma, recovering from the first after intravenous treatment, but relapsing three days later into a second, from which no effort could restore them. Intravenous injections of serum and adrenalin, oxygen by the mouth and subcutaneously, proved of no value. All cases had been treated with quinine by the mouth and intramuscularly over long periods at Salonica, and Richet and Griffin continued to give them fifteen grains daily by the mouth after intravenous injections. An attempt was made to treat all cases of malaria with continued high temperature and constant rigors with intravenous injections of quinine urethane, and the results were more than satisfactory. Practically every case yielded to this treatment, and the rapid improvement in the physical condition of the men was most marked.

Sometimes it was necessary to give two or three injections before the temperature remained normal and the gametes disappeared from the blood, and every endeavor was made to give the injection six hours before the rigor was expected, according to the type of malaria from which the patient suffered. In Salonica as much as 18 grains of quinine were injected at one dose, but Richet and Griffin never found it necessary to give more than 6 to 10 grains in one injection.

Several cases of pleurisy with effusion, but without any fever, occurred in malarial patients, and the fluid rapidly absorbed after intravenous injections. For the anemia arsenic was given by the mouth or sodium cacodylate injected hypodermically.

Many men arrived at the hospital with the chronic form of malaria which had well-marked symptoms. Chronic headache, often diarrhea and sickness, anemia, lassitude, with an evening rise of temperature to 100°, occurred in nearly all these patients, and the symptoms rapidly yielded to intravenous treatment.

The conclusion arrived at was that intravenous injection of quinine urethane was the only treatment of malarial coma and a valuable remedy for persistent fever and chronic forms of malaria; it was also painless.

Intramuscular injection of quinine was painful, and often cases arrived with indurated lumps in the buttocks from the effect of injection which later broke down into abscesses.

SMALLPOX VACCINATION BY PUNCTURE.

In the *British Medical Journal* of February 10, 1917, HILL says he believes that the best method of vaccination when many are to be vaccinated is as follows:

1. The sleeve is rolled up.
2. Orderly 1 washes the arm with soap and water.
3. Orderly 2 washes the arm with rectified spirits.
4. Orderly 3 washes the arm with ether.
5. Orderly 4 breaks the capillary tube of glycerinized vaccine and sets the rubber bulb or other method of expelling contents, handing it to Orderly 5.
6. Orderly 5 expels the vaccine at three (or four) points on the arm, making a triangle (or square) having not less than 2 inches between the points.
7. Orderly 6 sterilizes an ordinary sewing needle and hands it to the medical officer.
8. The medical officer punctures the arm through the drops of vaccine. Six tiny punctures, drawing no blood, are made through each drop, each set of six occupy-

ing a space of not more than 1/6 inch square. The needle is held almost parallel with the surface. Not over one-thousandth of an inch enters the epithelial layer. A peculiar little "snick" is felt as the needle point goes in.

9. Orderly 7 wipes off the vaccine.

10. The sleeve is pulled down.

(*a*) The total time from pulling up the sleeve to pulling it down again need not exceed one minute.

(*b*) After the orderlies have had a little practice three men per minute can be vaccinated without haste or carelessness.

(*c*) No after-treatment whatever is required; none should be used; the only direction to the men is leave it alone.

The results are:

I. In those not previously successfully vaccinated (and who have not had smallpox) nothing is found for several days; then develops a typical vaccinal lesion, consisting of one, two, three, or four firm pustules corresponding with the areas punctured. If left alone, without bandage or shield, etc., these remain firm and whole; then dry down into hard "buttons," which finally detach themselves, leaving a cleaned healed base, constituting a typical vaccine scar. If bandages, shields, etc., are used, the moisture from the perspiration, etc., thus retained, macerates the otherwise firm wall of the pustule, which then breaks, thus creating an ulcer open to infection.

II. In those who have been previously successfully vaccinated (or who have had smallpox), a raised red papule develops in a few hours; itches a little, sometimes develops a number of tiny vesicles over its surface, then dies down and disappears. This is the anaphylactic or accelerated reaction, indicating that immunity exists, sufficient to prevent typical vaccinal lesions.

III. Occasionally a mild reaction of this kind, instead of disappearing, develops into a typical vaccine lesion, the anaphylactic papules developing into ordinary vaccine pustules instead of receding and drying up. These pustules then run the ordinary course described under II. Evidently here the immunity from the previous vaccination, while sufficient to give anaphylaxis, was not complete enough for protection.

IV. Very occasionally no reaction of any kind follows the puncture. Only in such cases need revaccination be done. The probable explanation in the few cases observed was improper technique or old vaccine.

(*a*) Certain rare cases showed the anaphylactic reaction (II), although, according to the history given, they never had been successfully vaccinated and never had had smallpox. They showed history of "chicken-pox," however. Hill investigated two of these cases, communicating with the mother of each and securing from her a detailed account of the alleged attack of "chicken-pox." In one case it was quite evident from the mother's description that the attack was really smallpox; in the other it was extremely probable that it was smallpox.

(*b*) The only "bad arms" out of many hundreds done that have come to Hill's attention were constituted by slight inflammations about the bases of ulcers, due to prematurely knocking off the dried "buttons" after the vaccination process was quite complete, the buttons having become somewhat loosened but not ready for removal. It must be added, however, that some arms which had been bandaged despite instructions to the contrary flared up more than was necessary, and in a few instances the pustules opened.

For civilian practitioners, not able to employ eight or nine assistants to do the washing, etc., the technique, nevertheless, is so simple that no one vaccination operator need take over five minutes. Its great advantages in civil life are:

(*c*) Not even adolescent girls object to the punctures; there is no fainting, etc.

(*d*) There is no waiting, after the vaccination is done, for the vaccine to dry. The instant the puncturing is finished the surplus vaccine is wiped off and the sleeve pulled down.

(*e*) No bad arms, and no loss of time due to bad arms.

(*f*) In all open methods of vaccination

(scraping, scarifying, cross-hatching, etc.) one obvious source of "bad arms" is infection of the open wound, during and after the removal of the epidermis, from the mouth spray of the vaccinator, his assistants, and the patients themselves, especially if there be a number of the latter, crowding the office and all talking at once, as often happens. In the puncture method no epidermis is removed; moreover, the process is so rapid, and the exposure of the arm so short, that this really serious source of infection in the older methods is almost completely eliminated.

THE USE OF ETHYLHYDROCUPREIN IN DISEASES OF THE EYE.

In the *New York Medical Journal* of February 24, 1917, ZENTMAYER states that ethylhydrocuprein (optochin) is a valuable aid in the treatment of pneumococcal infections of the eye. It often acts as a specific in pneumococcal ulcers of the cornea, especially if the treatment is begun before active tissue destruction has occurred. Almost all cases of this type of corneal ulceration under the action of this drug, to use the words of Ramsey, manifested a shorter and conspicuously more favorable course than did those dealt with in earlier days by the well-recognized methods formerly in use. The evidence at hand as to its value in diseases of the cornea and conjunctiva due to other organisms than the pneumococcus or to other causes is insufficient on which to base a conclusion.

TREATMENT OF CROUPOUS PNEUMONIA BY OTHER THAN SPECIFIC METHODS.

The *Pennsylvania Medical Journal* for February, 1917, contains an article by FUSSELL in which he writes as follows about certain well-known drugs:

Digitalis.—This in the writer's experience is the most useful single drug in cases of pneumonia with an organic heart disease. Digitalis should be given from the beginning of the attack in moderate doses, ten drops of a good tincture three times in the twenty-four hours. This dose can be increased if the heart shows signs of dilatation; 10 drops used by the mouth or hypodermically can be given every three hours, care being taken that the quantity given is not large enough to cause poisoning by this most useful drug. Remember that when one uses digitalis he uses it because the patient surely needs help. Therefore see that the digitalis is obtained from a source which will insure a potent article. Good digitalis may be life saving, while a worthless drug may sacrifice a life that otherwise could be saved.

Strychnine.—Pharmacologists tell us that strychnine neither raises the blood-pressure nor stimulates the heart. Be that as it may, doses of 1/30 of a grain every three or four hours, used hypodermically, are of great value. The patient rests better, his pulse is stronger, he is distinctly improved by its use. Therefore, in severe cases in which there is toxemia, and in which the circulation is poor, Fussell believes full doses of strychnine are not only indicated but are useful.

Caffeine.—The alkaloid in two- or three-grain doses by the mouth, or caffeine sodium benzoate hypodermically, is of value when the patient is weak, either from grave toxemia or from failure of the circulation.

Camphor.—In the form of camphorated oil used hypodermically, one or three grains of camphor every one or two hours is useful. It is by no means a specific, but sometimes will help to lift the patient over the incline.

Nitroglycerin.—This is a much-abused drug. It is not a heart stimulant. The pulse becomes fuller after its use, but this is because the peripheral vessels are dilated. It is of apparent use when the heart is laboring and fighting against a high pressure. Then the peripheral vessels are enough dilated by the use of the drug to allow the heart to become more efficient. Cyanosis and a laboring heart are the indications for its use. It should be used in full doses for a short time.

Oxygen.—This gives relief to the patient with much cyanosis and laboring heart. The

respirations are quieted, the heart labors less. It is a good adjunct to fresh air. Fresh air, however, will usually make its use unnecessary.

Calomel.—If there is much abdominal distention this will do good by causing bowel movements and by apparently lessening the tendency to fermentation in the intestinal tract.

Eserine and Pituitary Extract.—These are of value where there is much abdominal distention. They appear to cause the expulsion of gas from the intestinal tract by stimulating the muscular coat.

THE TREATMENT OF COUGH.

STEWART in the *Practitioner* for February, 1917, in discussing the treatment of cough points out that the therapeutics of this common and useful branch of practice divides itself into two classes, viz., the useless and the useful cough.

Among the first are classed the dry stage of acute and chronic bronchitis, the initial stage of asthma, and the irritable cough of pleurisy. The rational treatment indicates an alteration, when possible, of the dry inflamed mucous membrane into a moist one. The dry bronchial surface must be stimulated to produce a sufficiency of thin liquid secretion, which can easily be got rid of by the useful cough. The cause being removed, the cough practically ceases. The remedies which produce this most promptly are the iodides, the action of which is often hastened when combined with an alkaline salt. Ten grains of iodide of sodium or potassium given four-hourly loosens the secretion in a very short time. In the worrying, dry, night cough of phthisis, caused by tough viscid mucus, ten grains of iodide, combined with a sedative if the irritation be excessive, administered at bedtime, gives great relief.

As an adjuvant to the iodides, expectorants are usually prescribed, but these, Stewart thinks, are of little value, and our knowledge of their action is purely empirical. The best expectorants are the iodides. They flush the whole of the bronchial tree with thin mucus, and nature does the rest. Before any appreciable use of expectorants can be obtained, the dose must be pushed so as to produce emesis; thus their effect is purely mechanical. Their striking use can be clearly demonstrated in a bad case of asthma, in which the lungs are mucus clogged; when vomiting has been produced by the administration of either apomorphia, ten grains of ipecacuanha, or three grains of tartar emetic, the effect is most striking, and grateful to the patient. Both apomorphia and tartar emetic get the credit of being depressants. Apomorphia has the advantage that it not only acts as an emetic, but is a sedative as well. In fact, Hare uses it in small doses with great success in the treatment of delirium. The depressing action can be counteracted by strychnine, given in the same injection. Ipecacuanha may be used with impunity, and the dose repeated if necessary.

The use of morphia in these cases should, if possible, be avoided. Though the sedative action is prompt, it really prolongs the attack by the diminution of bronchial secretion.

When the cough is excessive and produces irritation, the sedatives usually employed are opium, morphia, or some of its derivatives, the chief of which are heroin and codeia. Opium is generally given in the camphorated tincture of opium, and morphia in the compound tincture of chloroform and morphia (B. P.), or as the official liquor. The latter may be given in a very palatable and effective linctus, made up with hydrobromic acid, gum acacia, and chloroform water. Heroin and codeia also can be given in the same way, omitting the acid with heroin, for it is easily decomposed. Enterprising American firms have advertised heroin extensively, but as a rule the use of these preparations is not to be recommended; still they very often come in as a pleasant change to phthisical patients, who are often whimsical and most exacting.

The potency of morphia and heroin is just about equal, and is useful in "ringing

the changes." When a patient has become accustomed to morphia, the sedative effect is lost after a time; then a change to heroin or codeia makes an agreeable and effective variation.

If by any chance morphia disagrees, and the cough is convulsive, a combination of chloral and antipyrin may be given with profit. Stewart now dispenses with the chloral and only uses antipyrin, the dose of which should never exceed five grains. In a case of phthisis, when the cough is hard and distressing, with tough sputum, a good combination is ten grains of iodide of sodium, five grains of antipyrin, and, if the cough is irritable, five or ten minims of tincture of chloroform and morphia, given four-hourly. The antipyrin does not lessen the secretion of mucus, and relieves the fleeting pains in the chest so commonly complained of. In such cases the late Sydney Ringer recommended tincture of gelsemium. Stewart has tried this, and finds it acts very well in some cases, whilst in others it is almost inert.

In these days, when the many forms of tuberculin are so popular, the uses of creosote seem to have been forgotten. When the cough is violent it does no good at all, but in cases in which it is mild and chronic, a course of it, extending over some months at least, does a great deal of good. In cases of suspicious bronchial catarrh (formerly known as pretuberculous cough), it has a wonderful effect if it is properly given, and continued for a long period. In all cases of winter cough, the cough of chronic bronchitis, and bronchorrhea, there is no remedy in the Pharmacopœia to equal it. The usual method of administration is to drop it into milk. Given thus, the creosote frequently gets entangled in the teeth, burns the cheeks and tongue, and irritates the pharynx. This can be avoided by mixing the creosote with glycerin in equal parts. Another very good way is to drop the creosote on half a teaspoonful of sugar, and then fill up the remaining half with sugar. If this be objected to, it may be taken in gelatin capsules, mixed in olive oil so as to lessen its corrosive action, each dose being prepared separately, as the capsule generally leaks.

The dose of creosote should commence at five minims, increasing the dose daily by one minim up to twelve or fifteen. Doses over twelve minims generally disagree. The dose is given after meals, but with some it is best to give each dose just immediately before eating. In this way the creosote is mixed intimately with the food and easily assimilated, whilst no eructations result. Unfortunately, creosote does not lend itself well to compound pharmacy. In cases of chronic bronchitis with wheezing and thick expectoration, Stewart gives the carbonate of creosote. The mixture he finds best is ten grains of iodide of sodium, and twenty minims of carbonate of creosote, held in suspension by gum acacia, the soapy taste of the carbonate being disguised with cinnamon and chloroform water. He finds, too, that this mixture does very well in the tightness and stuffiness of breathing of chronic phthisis, and the attacks of dyspnea, almost amounting at times to attacks of asthma, the result of fibrosis in arrested cases of pulmonary tuberculosis.

EXCRETION OF SALICYL IN THE URINES OF RHEUMATIC AND NON-RHEUMATIC INDIVIDUALS.

In the *Journal of Pharmacology and Experimental Therapeutics* for February, 1917, HANZLIK reaches these conclusions:

1. The total excretion of salicyl is about 15 per cent less in rheumatic than normal individuals.

2. This difference is greatest in the early periods after the administration of the drug—that is, during the first ten to twenty hours.

3. The concentration of salicyl in the blood of rheumatic individuals at "toxicity" is less, and the concentration in the urine at this time is also less than in normal individuals.

4. These differences are not due to diuresis, nor to retention and vicarious excretion of the salicyl.

5. They seem to be due to an increased

destruction of the salicyl in the febrile rheumatic organism.

6. A lessened excretion of salicyl was demonstrated in a number of individuals representing such conditions as chronic alcoholism and morphinism, tuberculosis, and diminished renal functional efficiency as compared with normal individuals.

7. The administration of sodium bicarbonate together with the salicylate has practically no effect on the excretion of salicyl in the urine, or its "toxic" effects.

HOME-MADE BREAD SUBSTITUTES FOR DIABETIC PATIENTS.

In the *British Medical Journal* of January 20, 1917, NICHOLSON states that for some two years or so he has given up all proprietary flours and breads, and orders a bread made of peanut flour and casein. This is made for him quite easily in the kitchen of the Hull Royal Infirmary, and his private patients make it quite well at home. It has the advantage of being very nice to the taste, and can be cut readily in slices even as thin bread-and-butter. He has now several private patients who have made the bread twice a week and eaten it regularly for a year or two, and they like it.

The white of egg is beaten to a snow, and then the other ingredients (previously lightly mixed) are slowly added. The bread is baked in a sound oven in a tin.

Recipe.

Peanut flour, eight ounces.
Casein, two ounces.
A pinch of salt.
White of egg, twelve ounces.

Peanut flour is not expensive, and was offered to Nicholson a few months ago at 1s. 2d. for 3 pounds. The peanuts can also be bought. They should be placed on the top of the oven for a short time, when the husk can be rubbed off with the hand and the nuts ground in a small mill which can be bought for 2s. 6d. Casein can be bought anywhere. The whites of eight or nine eggs measure 12 ounces; though they are just now dear, most good housekeepers have put down a number in water-glass when they could be obtained at sixteen a shilling, and these will do very well. The yolks come in for the patient, fried or in any other way, or they can be used in the kitchen for other things.

This bread when tested with iodine gives only the faintest blue reaction. If preferred, the yolks also can be used in making the bread, and then only half the number of eggs is needed; but the bread is yellow, and Nicholson does not think it is so nice. The peanut flour can be replaced by almond flour, but it costs more, and his hospital cases do not like it as well.

He might add that casein and cream, as suggested by Dr. Williamson in the *British Medical Journal* a year ago, have been very satisfactory in Nicholson's hands.

He has lately treated several cases on the alimentary rest scheme with very good results. It is sometimes called the starvation scheme, but this is a bad name, and one that does not commend itself (under that name) to private patients. He gives four half-pints of black coffee in twenty-four hours, and nothing else; this he has found patients will take for three, four, or even five days without complaint. By that time the sugar has disappeared entirely from the urine. He then gradually adds cabbage 5 ounces, and in a day or two an egg, and then half a pint of beef tea, increasing each day or two (if no sugar appears), so that in ten or fifteen days the patient is getting meat 2 ounces, casein 2 ounces, cream 2 ounces, beef tea 1 pint, cabbage 10 ounces (or other green vegetables), three eggs, tea or coffee 2 pints, with cream, and some peanut bread with butter.

TREATMENT OF THE DRUG HABIT AND ITS RESULTS.

DERCUM in the *Pennsylvania Medical Journal* for February, 1917, thinks that an important point in regard to the treatment of the morphine habit should be emphasized, and that is that during the withdrawal of the drug certain symptoms make their appearance. These vary somewhat with the gradual or abrupt character of the withdrawal, but they are never absent if the withdrawal is actually taking place.

just as soon as the latter is effective, the patient becomes restless. Restlessness may become very marked and is always accompanied by a more or less marked insomnia. The patient is apt also to yawn or to sneeze a great deal. Often he complains of having caught cold, or perhaps he has an attack of difficult respiration simulating asthma. At times all of the symptoms of a frank attack of cold in the head or a troublesome cough make their appearance. In addition, the patient complains of a sense of oppression, is distressed and frightened, becomes fault-finding and resistant, and declares himself dissatisfied with the treatment.

The restlessness may become extreme; involuntary movements of the legs and arms may make their appearance, the limbs being thrown about the bed; at other times distinct involuntary jerkings and tremor make their appearance. Sometimes there is palpitation of the heart or a sense of fluttering in the precordia. Vesical tenesmus also may be noted.

If the patient has been in the habit of taking large amounts of morphine daily and the withdrawal has been abrupt and complete, a sense of great weakness and fatigue supervenes; the patient is soon unable to stand or to walk. He trembles from exhaustion and his body becomes bathed in sweat. There is a profound sense of sinking in the epigastrium, and very frequently gastric and abdominal pains make their appearance. Soon nausea, vomiting, and profuse diarrhea set in, the heart's action becomes weak, the pulse rapid, the extremities cold. In severe cases, or if the symptoms be not relieved by a temporary recourse to the drug, the patient may become greatly agitated and disturbed, moans or cries out, or may become confused or delirious.

It is exceedingly probable that the long-continued ingestion of morphine gradually results in the production of an antitoxin, so that little by little the patient becomes more and more tolerant to the drug. This tolerance or relative immunity can be explained on no other ground. Hirschlaff indeed has demonstrated the production of such an antitoxic principle experimentally in animals. It would seem that the symptoms arising during the withdrawal of the drug are largely due to the unantagonized action of the accumulated antitoxin. The sweating, the vomiting, the diarrhea can only be looked on as the efforts on the part of nature at elimination. For us the symptoms of withdrawal have an all-important diagnostic significance. It stands to reason that if in a given case none of these symptoms be present and if the patient continues comfortable, in good spirits, sleeps well, and is contented, he is obtaining the drug surreptitiously.

SCOPOLAMINE AND MORPHINE IN LABOR.

In *The Practitioner* for April, 1917, JOHNSTONE states that he has never seen any harm to the mother result from this treatment, but, on the other hand, a great deal of benefit. Nor has he ever seen a child lost through the employment of these drugs.

The method to which experience has gradually led him is as follows: In a primipara, a first injection of 1/6 of a grain of morphine and 1/100 of a grain of scopolamine (hyoscine hydrobromide) is given as soon as the pains are coming regularly and strongly at intervals of about seven to ten minutes, and the external os has definitely begun to open. In multiparæ, the same initial dose is given as soon as the pains are coming regularly and strongly, provided the labor may be expected to last at least four hours. It is essential that all such disturbances as the giving of an enema should be got over first. The first dose begins to produce its effect after from fifteen to twenty minutes, but Johnstone does not think the patient can be regarded as in any sense in a "twilight sleep" until after the second dose of scopolamine alone has been given. The initial dose of morphine intensifies the effect of the scopolamine and gives it a chance, which, if used alone, it would not have in the presence of pain, to dull the sensorium. This dulness may easily be maintained subsequently with minimum doses of scopola-

mine, provided the second dose is given before the effect of the morphine has begun to diminish. This, Johnstone thinks, is an important point, and he has found that it is almost always best to give the second dose of scopolamine about 45 to 50 minutes after the first dose. Usually the second dose is 1/200 of a grain of scopolamine, but if the patient is deeply affected by the first dose he gives less, perhaps 1/400. Thereafter, in the great majority of cases, the sleep can be maintained with doses of 1/400 of a grain of scopolamine at intervals of about an hour to an hour and a quarter. He does not think the best results can be obtained or expected by following any rigid routine in regard either to dosage or to the interval injections. The effect varies to some extent in different patients, and each one ought, if possible, to be judged separately, these points being decided by her condition as estimated either by a memory test, or by the extent to which she appears conscious of such manipulations as examinations. Experience soon enables one to form a good idea of how deeply she is drugged without employing any particular or specific test.

During the whole time the maintenance of absolute quiet in the room is an important point, and one to which nurses in particular require to be educated. Darkening of the room by drawing the blinds or curtains is also important, and, unlike Giuseppi, Johnstone has never found any difficulty in doing this, nor can he imagine any in an ordinary middle-class house. The patient should never be left alone. Either doctor or nurse must be in the room all the time, and if the former leaves the house, he must look in at frequent intervals, and inform the nurse of his whereabouts. Johnstone may have been unfortunate, but he does not think he has had quite such good results when he has left a case to routine injections by the nurse.

He usually administers a little chloroform during the actual passage of the head over the perineum. This prevents the patient making sudden movements.

All the 70 cases referred to were conducted in private houses or nursing homes. Forty-eight of the patients were primiparæ, and the maternal complications included albuminuria, cardiac disease, and minor degrees of contracted pelvis. With the exception of one breech case, they were all vertex presentations, and 17 were occipito-posterior in position. In 28 cases there was complete amnesia, the patient remembering literally nothing of the labor after the first or, more often, after the second injection. In 39 there was marked, but not complete, amnesia, with considerable analgesia. Of this class of results, multiparæ who have previously gone through a labor without the treatment are the best judges, and all such, with only one exception, were emphatically of opinion that the treatment had helped them greatly, and had left them feeling much better at the end of the labor.

In two cases the injections produced so much excitement that they had to be stopped and chloroform administered. In one the drugs produced absolutely no effect whatever.

With regard to the children, in only two private cases has he ever had any anxiety, even momentary. Strangely enough, these were both children of the same mother, a multipara. In the first instance the labor ended much earlier than had been anticipated. On the second occasion, omnopon had been used instead of morphine. The child was the first of twins, and was followed twenty minutes later by a second, which cried at once. In both these cases a warm bath was the most effective restorative.

In about half of his cases forceps were used, a little chloroform being given for any operative interference; but being a firm believer in the wholly beneficial effect of the timely and careful use of forceps, he does not feel prepared to say that the use of the drugs increased the need for their employment to any great extent. Nor does he think that the injections greatly increase the duration of labor, certainly not seriously. He does, however, think that there is a slightly greater tendency to uterine relaxation during and immediately after the third

stage, and although he has never had a serious hemorrhage, he makes it a practice to inject ergot or pituitrin in all these cases as soon as the placenta is born.

When the patient wakes up, an hour or two after the delivery is completed, one of the most striking benefits of the treatment becomes apparent, namely, the quite extraordinary sense of well-being. Owing to the painful stimuli having failed to make any lasting impression on the brain, there is an absolute absence of shock or prostration, and, to experienced multiparæ, this has been a perfect revelation. Just at first there may be a certain amount of incoherence in thought and speech, but that rapidly passes off.

Johnstone adds one or two more practical points. First, he has a thorough distrust of solutions of scopolamine, and always uses it in compressed hypodermic tablets. Secondly, although he has given as many as eleven injections to one patient more than once, he has hardly ever repeated the morphine. It is beyond doubt that it is the morphine that produces the oligopnea in the child, and, accordingly, it should never be given if there is reason to expect the birth within two and a half hours. He thinks Dr. Fairbairn's six-hour rule on this point errs on the safe side, and would exclude many suitable cases. Dr. Hedley's rule of never beginning the treatment in the second stage is a little sweeping, although Johnstone agrees with him that the best results are never got when this is done.

With all deference to Giuseppi, Johnstone must confess that he is not in the habit of worrying over the fetal heart. He believes that it is the morphine that affects the fetus much more than the hyoscine, and as he never repeats the morphine—or hardly ever—he thinks that in most cases repeated auscultation of the fetal heart is unnecessary. He knows of no real evidence that the hyoscine in the minimum doses recommended affects the fetal heart to any dangerous extent. In any prolonged labor one auscultates, but not because one is employing scopolamine.

By those about to try the treatment for the first time there are two points worthy of remembrance. The first is that the aim of the treatment is not anesthesia, nor even analgesia in the first place, but amnesia. If the injections result in the patient appearing to suffer no pain during the uterine contractions, then she is definitely overdosed. The patient ought to groan and move herself a little during each pain, and in the intervals fall into a sleep. During the pains she may answer questions, or complain of the suffering in perfectly coherent language, and ask for water, which should be given her. But in spite of this apparent consciousness of the sufferings, she will be found to have afterward little or no recollection of it.

Secondly, the babies after scopolamine-morphine treatment are usually a little sleepy, and rarely cry much for the first twenty-four hours. But provided the child is breathing regularly, even though slowly, there is no danger. If its color is bad, then the usual artificial respiration is required, and Johnstone has found a warm bath most helpful.

In all probability a slightly cyanosed baby would come right in due course without any treatment at all. But while Johnstone has never had the courage to act upon this opinion, he does think that there is some unnecessary nervousness about the minor degrees of cyanosis and oilgopnea occasionally experienced with this treatment.

On account of the time and personal attention needed, Johnstone doubts if the treatment can ever be expected to be adopted widely in general family practice. Anything like indiscriminate use of it would certainly be dangerous.

A SIMPLE DIETETIC TREATMENT IN DIABETES MELLITUS.

In the *British Medical Journal* of February 3, 1917, WILLIAMSON says that he desires to call attention to a simple method of dietetic treatment which he has found of the greatest service, in many cases of diabetes, in checking the glycosuria, at least temporarily. It is free from risk, quite palatable, and can be taken by almost all

patients. It is worthy of trial in most cases of diabetes if the ordinary diabetic diet does not promptly check the glycosuria.

The treatment lasts for a week or ten days only; during this period the patient ceases work and rests on the sofa. Every two hours from 8 A.M. to 10 P.M. he receives a small amount of food—eggs, cream, milk, beef tea, and tea—according to the following diet sheet:

8 A.M.—Coffee or tea, with one tablespoonful of cream. One egg (poached, boiled, or buttered).
10 A.M.—A glass of warm milk (half a pint).
12 NOON.—Custard (prepared from one egg and half a pint of milk).
2 P.M.—A glass of warm milk (half a pint).
4 P.M.—Tea, with one tablespoonful of cream. One egg (poached, boiled, or buttered).
6 P.M.—Cream, 2 tablespoonfuls in half a pint of warm beef tea.
8 P.M.—A glass of warm milk, or one egg beaten up and added to half a pint of warm beef tea.
10 P.M.—Cream, two tablespoonfuls, in half a pint of warm beef tea.

The order of these meals may be varied or slightly modified as the patient desires. The patient takes no other food. The bowels are kept regular.

In many cases the glycosuria ceases in a few days, in other cases in a week or ten days, although an ordinary rigid diabetic diet had failed to check the sugar excretion. If the sugar excretion does not cease on this diet of eggs, cream, milk, and beef tea, carried out as just described, in the course of a week or ten days, Williamson discontinues it and tries some other method of treatment. After the glycosuria has been checked he changes gradually, at the end of seven or ten days, to a diet of solid food. First a little diabetic bread is allowed with the tea and egg at 8 A.M. and 4 P.M., and two of the other meals are diminished or omitted. Then a day or two later bacon and green vegetables are allowed, followed by a custard, in place of the meals at 12 noon and 2 P.M. The meals at 10 A.M., 6 P.M. and 8 P.M. are omitted, and the tea and egg taken at 5 P.M. instead of 4 P.M. If the glycosuria does not return then the bacon at midday dinner may be replaced by fish, and later by fowl or meat. Later the ordinary diabetic diet may be allowed, and still later, if no sugar returns in the urine, a small amount of white bread may be given.

Of course, this treatment for a week or ten days with the diet of eggs, cream, milk, and beef tea, in the manner just described, does not remove the glycosuria in all cases of diabetes; but it is interesting to note how often it will do so, when a previous treatment with the ordinary rigid diabetic diet has entirely failed to check the sugar secretion.

If the glycosuria returns at a later date, the patient may try again for one week the diet of cream, eggs, milk, and beef tea, and repeat it from time to time if necessary.

The permanent value of this treatment cannot yet be estimated, but it is a method which is more prompt and powerful than the ordinary rigid diabetic diet.

The dietetic treatment (with cream, eggs, milk, and beef tea) just described is (1) simple; (2) less expensive than diabetic breads and foods, and specially suitable now on account of the increased price of diabetic foods through the war; (3) it can be taken by nearly all patients, and is quite palatable; (4) it can be taken by nearly all patients who cannot take casein or biogene; (5) it does not require any very special care or watching; (6) it is very useful and suitable in the case of diabetic children; (7) it is often very successful, and often removes the glycosuria when an ordinary rigid diabetic diet has failed; in other cases, like all other treatments, it is not successful; (8) after taking this diet for seven or ten days the patient may then often take an ordinary rigid diet, and continue it for a long period without the return of the glycosuria, whilst previously such a diet had entirely failed to check the glycosuria; (9) in some cases it removes the diacetic acid as well as the sugar, but not in many others; (10) probably it is not so often successful as the treatment with casein (which Williamson has previously published), but if it should fail, the latter treatment may then be tried, or a combination of the two methods may be tried.

The diabetic treatment described in this article should be continued for seven or ten days only. It is to be regarded as a method usually very much more successful than an ordinary rigid diabetic diet in removing the glycosuria temporarily, and its after-effects probably continue much longer. If later the sugar returns in the urine the treatment may be repeated. The earlier the treatment is tried the more likely is it to produce satisfactory results. It is worthy of trial in most cases of diabetes if the ordinary rigid diet does not check the glycosuria in one or two weeks.

VENEREAL DISEASES AS WE SEE THEM TO-DAY.

McDONAGH (*The Practitioner,* December, 1916), who long since suggested that the spirochæta pallida is not the sole cause of syphilis, but only the adult male form of the leucocytozoön syphilidis, after quoting Harrison to the effect that this extraordinary work received no confirmation, reports that it has been repeated and confirmed by Peyri of Barcelona, and by Klausner of Prague.

He speaks with some truth of the fact that the longer a view in medicine takes to be accepted, the more correct it is, and *vice versa.* He published his work in German to prevent the Germans repeating the work and publishing it as their own discovery. One publisher wrote him saying the publication was impossible, for the work caused considerable annoyance to the professors of the city.

He severely criticizes the statistics of the Royal Commission on Venereal Diseases. He sums up his own view concerning the lessening of incidence of venereal diseases as follows: That nothing short of prevention is going to diminish the spread of venereal diseases. All we can do at present is to aid those infected, and strive to discover some preventive measures. Preventive measures are what we are in need of most, and such measures are most likely to come from men who are confining themselves to the study of venereal diseases, and combining pathological and clinical work. The best way to get such men is to make whole-time appointments, to be held by one or more men in every town which has a population of over, let us say roughly, 30,000 inhabitants. These venereal specialists would in no way be hampered, for the treatment, etc., in vogue at each town would be that which the specialist himself deemed the best. Every incentive should be given to the men appointed to do research work, the incentive being in the form of money promised, according to the practical value of the research work done. The best men would soon come to the fore, and they would be judged by the merit of the work they produced.

As to the cause of syphilis, McDonagh speaks of "The German Syphilitic Trinity," by which he means that the spirochæta pallida is the sole cause of syphilis; that a positive Wassermann reaction signifies that the patient has active syphilis; and that Ehrlich's salvarsan cures syphilis, owing to its parasitotropic properties. All these contentions he denies.

DIAGNOSIS OF DEATH AT THE FIRING LINE.

SATRE (*La Presse Médicale,* Dec. 4, 1916), writing upon this topic, states that the decision as to whether a wounded man be living or dead may be extremely difficult, but in case of doubt resuscitation should be attempted at once and should be continued according to Laborde from six to twelve hours, particular confidence being placed upon rhythmical traction of the tongue. This long continuance in the absence of signs of respiration or cardiac or respiratory function is not to be expected even under most favorable circumstances, certainly not at the battle front. Therefore whilst the means of resuscitation are vigorously practiced it becomes desirable to discover a sign by which it may be known whether or not life is extinct. It is held that feeble circulation may be maintained in the entire absence of perceptible cardiac motion as detected either by palpation or auscultation. Without any cardiac motion circulation is, of course, still. It has been

abundantly shown that if the circulation be still for a maximum of fifteen minutes, the restoration of life is impossible. Therefore the question is to decide as to whether the circulation is or is not absolutely stilled. This Itard settles by injecting two grammes of fluorescence dissolved in 10 cm. of an alkaline solution. If there be any circulation at all this drug injected into the buttocks or abdominal wall will be carried through the vessels to all parts of the body and produce a magnificent jaundice perceptible on both the skin and mucosa, whilst the eye becomes comparable to an emerald in its green color. Ambard and Brissemoret, noting that in death the splenic pulp and liver pulp shortly become acid, make their test by thrusting the needle of the syringe into one of these organs and withdrawing the needle slowly, whilst suction is made in the barrel of the syringe until such point clears the viscus involved. Thereafter the splenic pulp and liver parenchyma are placed on tournesol paper and show acid by turning the latter a rosy pink. The needle should be seven or eight centimeters long. The action is perfectly characteristic two hours after death, less marked half an hour after death, but still perfectly clear. This acidification of the viscera is due to an autolysis of tissues. The suction of the syringe is maintained both during and with the withdrawal of the needle from the viscus, and any accidental blood drawn along with the tissue is wiped off on a paper before the shreds of tissue are subject to the test. The author continues his remarks to the effect that one should find rigor mortis or decomposition before pronouncing a patient really dead.

ANTERIOR POLIOMYELITIS.

WHITMAN (*Medical Record*, Dec. 16, 1916) thinks orthopedic treatment is that which aims primarily to keep the machinery in condition to take up its work, if repair of the nerve centers permits, and to adapt by some means the disabled members to the needs of the individual. The prevention of deformity is of the first importance, because deformity throws the machinery out of gear. By far the larger number of patients in all classes of society become deformed to a greater or less degree and therefore necessarily disabled, deformity being the inevitable consequence of the disease unless it be prevented. The causes of deformity may be classified as the force of gravity; persistent attitudes; unbalanced muscular action; weight-bearing and locomotion.

The influence of the force of gravity is best illustrated by the hanging downward of a paralyzed foot when the patient is sitting or recumbent. After a time the habitual attitude becomes fixed by contraction. Thus the hanging foot, or what is called equinus, is the most common of deformities.

Certain attitudes are often induced by discomfort, or they may be simply accommodative, as the sitting posture, in which the limbs are bent at the hips and knees. Thus flexion contraction at these joints is very common among patients who are unable to stand.

The muscles in health vary in strength according to their function and are arranged to support and balance one another. The calf muscle, for instance, is large and strong, because it lifts and propels the body, while the smaller muscles balance the foot. Paralysis of the calf muscle causes great disability with but little immediate tendency to distortion, because it is opposed by the force of gravity; while paralysis of lateral muscles of comparatively slight importance will induce deformity, because the foot is drawn to one side by those of the opposite group.

Locomotion and weight-bearing upon a weak and unbalanced extremity exaggerate existing deformity, and increase the resistance to correction. Deformity develops, therefore, more rapidly and to a more extreme degree in early childhood than in later years.

Prevention of deformity is the most important part of the treatment from first to last, since if it is present it is impossible for normal muscles to act effectively, and for weak muscles to respond to impulses

and to regain their strength. It develops insidiously and far more rapidly than is generally believed; more rapidly in the partly paralyzed cases than in those of complete paralysis, because the influences of the force of gravity and accommodative posture are increased by unopposed muscular action and by retraction of active muscles that are never as in health stretched to their normal limit.

The first indication of deformity is the evidence of discomfort when a habitual attitude is changed—when, for example, a hanging foot is pushed upward. And in cases in which the muscles of the front of the leg are paralyzed and the calf muscles are active, this discomfort is often apparent within a few days of the paralysis; in fact, much of the pain supposed to be symptomatic of the disease is actually induced by tension on contracted tissues.

Preventive treatment consists in moving the joints of the affected part through their full range of motion at least twice daily in order that all the muscles may be extended to the normal limit. Postures should be alternated, and attitudes that lead to deformity should be restrained. If, for example, the trunk muscles are so weak that the body is bent forward or to one side in the sitting posture, the child should not be permitted to sit unless it is properly supported, nor to stand or walk on weak and uncontrolled limbs.

The secondary part of the treatment is directed to the preservation of nutrition of the paralyzed parts. Nutrition depends upon the circulation of the blood, and the supply of blood is regulated by the work performed by the muscles. Paralyzed muscles do not work, consequently they receive less blood. Paralyzed limbs become, therefore, eventually shrunken, cold, and discolored; the capacity of the blood-vessels having been lessened because no demand has been made upon them. These changes are far more noticeable in deformed and unused limbs than in those which, although equally disabled, have by treatment been forced to carry out as far as may be their normal functions.

Nutrition may be improved and in some degree preserved by local treatment. That which is usually applied is rubbing and friction, under which warmth and color may be restored to the paralyzed part. Parents do not understand the objects of so-called massage, but look upon it as a direct treatment of the disease, and what they rub in is of greater importance than the rubbing. Oily substances are supposed to feed the weak tissues; actually they only serve to lessen friction, which in these cases is desirable since only gentle rubbing should be permitted.

Baths, to which in health parents are unaccustomed, are thought to possess mysterious virtues, and this belief may be encouraged. A warm bath in which the child may lie extended stimulates the circulation and assures the most favorable opportunity to demonstrate muscular activity in the floating limbs, because it is not opposed by friction and gravity.

The most impressive of all remedial agents is electricity, because the paralyzed muscles may, for a time, respond to its stimulation. It has been employed for many years in the treatment of all forms of paralysis, but no positive evidence has been presented that it has any effect other than as a local stimulant of nutrition. It is far better adapted to the treatment of older patients than of young children, who are usually frightened by even the slight discomfort attending its application.

The treatment that is in the air at present is muscle training. Just as strong muscles may be made stronger by systematic exercise, so weak muscles may be made stronger by exercises adapted to their weakness. This is, of course, self-evident. There are very decided limitations to the method. Paralyzed muscles cannot be trained, and young children are usually poor subjects either for muscle training or muscle testing. The treatment is of great value in suitable cases. If properly applied it should lessen the tendency to deformity and aid the restoration of power in muscles in which such restoration is possible. If all the muscles are equally weak any improvement

in strength is so much gain, particularly in an upper extremity. If, on the other hand, the weak muscles are capable of recovering but a fraction of their strength in opposition to the full power of an opposing group, deformity cannot be prevented in a weight-bearing extremity, except by mechanical or operative treatment.

Braces are used to prevent deformity and to permit locomotion. If the paralysis is general of the trunk and limbs, the child may be placed on a recumbent frame, on which it may be carried about, because if permitted to sit deformities of the trunk would develop, which are progressive and intractable. Or, as a temporary treatment, a plaster support may be applied, which, by fixing the spine, assures the rest that favors the repair of the inflamed spinal cord, and holds the uncontrolled and often sensitive limbs in proper position. Plaster supports are of value, also, as temporary braces during the early stages of the disease, before the extent of the persistent paralysis can be determined.

The braces are chiefly valuable as aids in locomotion; for as soon as the discomfort has subsided a child will insist on moving about. if this is possible. Braces are employed to protect the weak muscles and to lessen the strain upon the joints which would otherwise induce deformity.

Functional use, if properly regulated, is the most powerful of all the stimulants toward recovery, as contrasted with purely local treatment. For the muscles and the nerve centers are interdependent, and if a limb is permitted to become deformed and shrunken from disuse the nerve centers, although capable of transmitting impulses, may atrophy for want of practice, while those upon which constant demands are made should develop their capacity to the highest degree. Functional use is often impossible without support, and the character of this support is, therefore, of greatest importance in treatment, since it must be often changed in adaptation to the needs of the patient.

It has been stated that it is impossible to predict the degree of final paralysis in any case, since improvement may continue for many years. There are, however, certain very definite indications on which to base the prognosis. In favorable cases there is evidence of returning power in certain muscles throughout the paralyzed limbs, indicating repair through a corresponding area of the cord. The instances of practical recovery after many years of helplessness are cases of this type, in which restoration of function has been prevented by deformity, although the nerve centers have been repaired. The unfavorable cases are those in which, in spite of protection, certain groups of muscles in a definite area show no sign of power, while in other parts recovery has been partial or complete.

When the area of permanent paralysis can be accurately determined, usually after an interval of several years from the onset of the disease, operative treatment may be indicated, and this is, from the positive standpoint, the most effective of all remedies. It consists essentially in transferring active muscles from their original insertions to points where they may work to best advantage, thus to restore the muscular balance; and in operations on the bones and joints to assure stability, so that braces may be less burdensome or discarded altogether.

In the present stage of enthusiasm, Whitman is inclined to think that there is more danger of overtreatment than of neglect, and that as far as young children are concerned the possible benefits of massage, electricity, and muscle training in a crowded clinic are more than offset by exposure, fatigue, and excitement, not to mention the time consumed by the mother.

The clinic should be the central point for observation, supervision, and teaching, while the mother, properly instructed and aided, if necessary by the visiting nurses, must be depended upon to carry out the supplementary treatment. Muscle training, for example, however difficult in its adaptation to many patients, is very simple in its application to a single case; although it requires art, patience, time, and opportunity, qualities and conditions hardly available in a large clinic.

In conclusion, it seems to the author that the contributions of those who are interested in this subject may be used to best advantage by increasing the facilities of the hospitals and clinics already equipped for the work, and by providing a larger number of social workers and visiting nurses, with adequate means of transportation, all under central control, than by establishing new clinics in more convenient localities, on the supposition that daily treatment is essential. In other words, that the best results from the educational, scientific and humanitarian standpoints may be obtained by a concentration rather than by a diffusion of energy.

THE REMOVAL OF STONES IN THE KIDNEY.

W. J. Mayo (*Surgery, Gynecology and Obstetrics,* January, 1917) reports 450 patients subjected to 484 operations with a mortality of 0.6 per cent. The presence of stone was shown by the roentgenogram. By the pyelogram it was located as in the pelvis, calyx, or parenchyma. Gall-stones sometimes gave confusing shadows. Nearly 10 per cent had stones of both kidneys. Unless the condition of the opposite side is acute, the stone from the least involved kidney is first taken away. About two weeks later that from the other side is removed. Where the second kidney maintains considerable function and yet exhibits a large branched stone, this has occasionally not been interfered with and in several instances has not progressed during the course of years. In half the cases of bilateral stone the second kidney was found pyonephrotic, a condition necessitating nephrectomy.

Stones were found in a solitary kidney in three instances; in two in horseshoe kidney. In one of these horseshoe cases pyonephrosis developed in the left half of the organ. This was resected and recovery followed. Two patients showed duplication of the renal pelvis. In each case the caudal pelvis was involved. In one case resection of the upper half of the kidney was necessitated. Stone formation in the remaining kidney after nephrectomy is an uncommon occurrence. There were only two instances in the series reported. Multiple stones of the parenchyma of the kidney are prone to recur. In one case 28 were taken from one kidney and 26 from the other, with recurrence within two years in both sides. Multiple parenchymatous stones in both kidneys occur but rarely, according to Braasch in but five of 48 cases of bilateral stones.

One of the most common causes of recurrence of stone has been the attempt to conserve a badly damaged kidney which was of little use functionally and a continuous menace to the future health of the patient.

If both kidneys are involved extensively it will be needful to save them both. After removal of the stones under these circumstances, the pelvis of the kidney should be drained by a rubber tube through the cortex, and each calyx containing a stone, which has extended out into the parenchyma by atrophy necrosis until it can be felt with the finger as a softened area in the cortex, should also be drained separately through a counter-puncture. Drainage provides an opportunity for the relief of the infection and also for contraction of the large renal cavities from which the stones were removed. Small cigarette drains are satisfactory for the drainage of the calyces and smaller stone-containing pockets. Recurrence of stone is sometimes due to an attempt to remove through too small an incision, leaving shells or fragments. If stones are superimposed upon each other the radiograph may fail to show more than a single shadow. Careful examination at the time of operation should be made to exclude this error, and moreover the patient should be roentgenogrammed before discharge from the clinic. The percentage of recurrence of stones will be small, certainly under 10 per cent, if at the time of operation good judgment is exercised in selecting and carrying out the best surgical procedure for each individual case.

Next to soiling from septic contents of the kidney itself, lack of hemostasis is the most frequent cause of those processes which directly or indirectly lead to sepsis and death, or those secondary conditions

which end in recurrence of stone, hernia, or other sequelæ.

Pelviolithotomy was practiced in 206 cases and is the most generally useful operation. The kidney is separated from its capsule and brought well up into the wound, thus exposing the pelvis in the notch. If the stone is felt, it is removed by direct incision, and a search is made by the finger within the pelvis for others. The pelvis is then sutured with catgut, the kidney dropped back into position, carefully surrounded by its fatty covering, and two or three rolls of rubber tissue are introduced into the kidney space to provide temporary drainage. If the stone cannot be felt, the fatty tissues are dissected back from the pelvis in a flap-like manner, and the stone is located by a finger introduced through an incision into the pelvic cavity, and removed. The capsule is then sutured with a few interrupted sutures of catgut, and the fatty fascial flap replaced and sutured in position. Drainage of the pelvis of the kidney is rarely required after pelviolithotomy for uncomplicated stones in the pelvis. In 34 cases a counter-puncture was needful to remove stone situated in the calyces not accessible from the pelvis. In such cases each cavity should be drained separately, at least one tube leading to the renal pelvis. In 40 cases nephrolithotomy was performed, an operation which has frequently been followed by secondary hemorrhage coming on in from four to ten days, at times so severe as to require nephrectomy. If more than one cavity is present each is drained.

Nephrectomy was done in 204 cases, subsequent pathologic examination proving the entire wisdom of this course in all instances. In some cases pyonephrosis of the kidney may be encapsulated by a massive wall of connective tissue, and the attempt to remove it with the protective wall will be difficult and may involve wounding of neighboring parts, particularly on the right side, the vena cava, and the duodenum; therefore decortication. The kidney is drawn out of its capsule and the latter is separated with a knife from the sinus of the kidney and is folded back over the pedicle. This allows the kidney with the renal vessels to be drawn through the capsule, top and bottom, and makes possible separate ligation of the vessels. The most difficult nephrectomies are those following a nephrotomy which has left a fistula leading to a remnant of kidney. The safe way is to introduce a knife through the fistula to the kidney, and then split all the outer wall until a sufficient opening has been made for subcapsular nephrectomy. If forceps are left on the pedicle they should be unclamped at the proper time—48 to 72 hours. Do not remove them for eight to twelve hours afterward in order that the tissues firmly compressed may have an opportunity to retract. Should the fistula lead into a calcareous pyonephrosis, previous to operation any contained tube should be removed several days before the nephrectomy.

As to exploration, Mayo points out that there are a few cases in which it is impossible for the urologist to determine the actual condition of each kidney by cystoscopic data and functional tests. Exploration of each kidney may therefore become needful. It may be done by examining the presumably sound kidney before operating on the kidney known to be affected; exposing the affected kidney and judging from its condition the probable functional capacity of the remaining kidney, and opening the peritoneal angle of the incision and exploring the second kidney with the hand, intraperitoneally. The latter method is of little value unless the kidney to be examined is grossly affected.

Intraperitoneal complications can be readily detected through the peritoneal incision.

In very fat persons or those with certain deformities, it may not be possible to safely bring the kidney sufficiently into the wound to remove the stone. Sometimes fracture of the twelfth rib just behind the angle will give sufficient space. In other instances Mayo has removed enough perirenal fat to expose the kidney *in situ*, much as one would expose the uterus within the peritoneal cavity.

Occasionally large renal veins produce

hemorrhage, usually checked by using catgut and a small needle. Injuries of the cava can be controlled in the same manner. In the case of renal arteries of considerable size which have been injured, primary nephrectomy may be needful since these are end arteries. Even considerable laceration of the pelvis due to difficult extirpation sutured with catgut and a fascial flap applied about it heals primarily. In one instance the pelvis was completely detached from the kidney. It was reattached with fine catgut sutures, but not in complete apposition throughout the entire circumference. The suture line was covered with a fatty fascial flap and good union and function resulted.

Injuries to the duodenum may occur as the result of rat-tooth forceps and a hasty attempt to check hemorrhage from the pedicle of a kidney which has slipped. Such forceps should never be used hastily, because of this danger and because the bleeding is so easily controlled by catching the vessels with the thumb and finger. When injury does occur to the duodenum, the accident will show at the end of a few days as necrosis permits escape of the duodenal contents. Unless the abdomen be opened anteriorly, the retroperitoneal part of the duodenum exposed, and the fistula sutured, the patient will die within three weeks.

CANCER OF THE LOWER BOWEL.

CHARLES H. MAYO (*Long Island Medical Journal*, April, 1917) states that in this country, due to the increased knowledge of malignant disease of the large bowel and to the fact that patients are now seen earlier, there has been a gain of nearly 50 per cent of operability. In the Mayo clinic the former operability of 53 per cent has advanced to 71 per cent within a few years. When we consider that the operative mortality is nearly 50 per cent lower, that in cancer of the rectum five-year cures have increased from 10 per cent to 35½ per cent since 1900, and that in cancer of the right colon the five-year cures are now 54 per cent, including the natural death-rates for period and age, we appreciate the enormous saving from death and from disease attended with so much suffering.

Within recent years there has been added to the surgeon's work the treatment of non-malignant disease of the colon, such as chronic local and general diseases attributed to intestinal toxemia; also that of chronic constipation and malposition of the colon, especially sagging of the transverse colon. The experience derived from such cases added to that gained from the surgery, which, for lack of a more expressive word, he calls legitimate surgery of the bowel—*i.e.*, the surgery of tumor, diverticulitis, cancer, and obstruction—has developed many points of exceeding interest.

In its development the large bowel is formed on the left side of the spine and rotates around the superior mesenteric artery as an axis, the cecum being under the stomach at the third month of fetal life, then under the liver, finally reaching the right iliac fossa. Such a rotation leads to the observation that all structures necessary to the vitality of the organ are to be found in the inner leaf of its mesentery; the outer leaf is merely attached to the parietal peritoneum, the separation of which along the line of adhesion immediately mobilizes the colon without injury and greatly simplifies operations on it. It is noted that there is great variation in the length of the intestines, both large and small, the total length varying from 12 to 33 feet, or from the short carnivorous to the herbivorous intestine. Metchnikoff laid much stress on the fact that the absorber of liquids is the colon, that the contents of the small intestine, after removal of 90 per cent of the protein food value, are delivered to it in a liquid state. It is also shown that the peristalsis, unlike that continuous form seen in the small intestine, is sudden, active, and intermittent, occurring from two to possibly six times in twenty-four hours in the right colon when the absorption of liquids reduces the mass to proper consistency. The lymphatics play little part in this absorption; it is principally a filtration into the portal venous

system for purification in the liver. Years ago W. J. Mayo pointed out that the removal of the right half of the colon relieved constipation, and later observations show this to be due to the loss of the large absorbing surface. The retention of fluids could be compared in effect to an enema given at the top of the remaining large bowel. There has been sufficient surgery for the relief of the non-malignant or toxemic conditions of the large bowel to show that constipation is merely one of the symptoms, and that its relief is not necessarily a cure of the general condition of the individual.

As the colon naturally harbors several varieties of bacteria a considerable part of the bowel movement is due to the growth and activity of some of them, and because of such bacteria there is an added danger of peritoneal sepsis in operating on the organ. The suture lines must be both gas-tight and water-tight. Tension unrelieved on these suture lines, no matter how perfectly they are constructed, will cause them to give way to necrosis after two days of pressure. Fortunately such tension seldom occurs, yet safety-valves for immediate or secondary use in delivering gases are of great advantage when needed. Thus suture operations on the left half of the colon or transverse colon may be protected from gas pressure by an appendicostomy, and in the removal of the right half the end of the transverse colon may be incorporated in the closure of the abdominal incision, projecting through the peritoneum into the muscle, to be opened if needed. This is necessary in approximately 20 per cent of cases. Bloodgood similarly applies the ends of the bowel into the abdominal incision after resection of the sigmoid with lateral anastomosis of the bowel. The same result is accomplished when tubes are passed high into the colon through the anus, where they are maintained for several days.

Because of the septic character of the contents of the large bowel the lymphatics have been nearly eliminated from the mobile organ; they are very few and inactive as compared with those of the small intestine, and practically can be considered as connected only with the outer surface. This is of great importance as it shows why malignant disease remains local for such long periods. Thus autopsy findings in death from cancer of the colon prove that the disease was still local in more than half of the cases, death being due to obstruction, perforation, or peritonitis. Very extensive operations are indicated if the disease is local, and it is to be considered local if there is only contact involvement. If the growth has become attached to the bladder, the attached portion of the bladder should be removed; if attached to the uterus, a hysterectomy should be done. It may be necessary to remove one or two loops of small intestine, or the prostate or seminal vesicles, in order to do a thorough operation. On the other hand, if there are grafts at a distance on peritoneum or intestine, or if there is distant glandular involvement or secondary growths in the liver or other regions, no radical operation should be attempted to relieve obstruction. If an operation is done it should be palliative only.

Cancer of the rectum below the peritoneum, being fixed, receives greater traumatism from the harder fecal masses than occurs in the movable part of the bowel within the abdomen. Here lymphatics are actively concerned in the transmission of disease, and in the inch and a fourth of the anal canal there is a double lymphatic return. The disease occurring in this region (epithelioma) is fortunately of the slower cell growing type; only 6 per cent of the cancers of the rectum are found in this short outlet; 24 per cent occur between this point and the peritoneum; while the greater number extend from this lower rectum to the upper rectum or rectosigmoid, and are of the adenocarcinoma type.

Perineal operations are often advisable in cancers of the lower rectum. The majority of the cancers are higher, and abdominal exploration is nearly always advisable to determine the extent of the disease and the method of procedure indicated. Thus the ill-advised radical procedure is avoided

when cure is impossible. Colostomy is not such a serious inconvenience when it can be carefully made without the urgent necessity of acute obstruction; an uncontrolled perineal outlet when the sigmoid loop is also lost is far worse.

THE DESTRUCTION OF ANGIOMAS AND OTHER NEW GROWTHS BY THE INJECTION OF QUININE AND UREA HYDROCHLORIDE.

BABCOCK (*New York Medical Journal*, March 3, 1917) impressed by the intense necrosis produced by the injection of quinine urea hydrochloride in the vascular tissue, used this solution in the treatment of angiomas. A strong solution into the skin produces an instant intense burning, quickly followed by analgesia. The area injected becomes white, anemic, and necrotic, and a few days later a shrunken, adherent black eschar marks the point of injection. The surrounding edema disappears in a few days, the eschar separating slowly, with little evidence of inflammation or pain. If a considerable area has been injected, there is left a deep ulcer which heals slowly, but usually with little pain or inflammatory reaction. If the injection is made deeply into the tissues an area of necrosis occurs which gradually becomes replaced by fibroconnective tissue. Objections to the use of this necrotizing agent are, first, the primary transient but intense pain; the marked secondary anemia; the sluggishness of the residual ulcer; the transient induration of the eschar; and the possibility of serious symptoms from quinine idiosyncrasy.

The advantages of the method are the intensity of the necrosis produced, the persistent anesthesia, the low toxicity, and the convenience of application.

In a cavernous angioma of the inside of the cheek the injection was followed by the escape of a few drops of blood from the needle puncture, after which there was rapid necrosis, the slough separating without any evidence of hemorrhage and with complete removal of the tumor. A painless edema involving the entire half of the face had largely subsided at the end of a week. Cavernous angiomas of the face in infants are often difficult to treat, as they tend to recur and grow after the use of various destructive agents. In one such tumor of the forehead of an infant that had recurred after the use of electric desiccation, fulguration, the application of carbon dioxide snow, and other measures, the injection was followed by the formation of a black eschar and an apparent cure.

Internal hemorrhoids injected with a twelve- to fifty-per-cent solution of quinine and urea hydrochloride promptly become necrotic and drop off after a number of days. The associated marked edema, especially from the stronger solutions, is a distressing complication, the rectal mucosa projecting through the anus suggesting to the patient that his condition has been markedly exaggerated. Unfortunately in this region the secondary analgesia may not be entirely efficient, and usually the sphincters should be well dilated before the injection; otherwise the patient may at times suffer more from this treatment than from the conventional clamp and cautery operation. For large urethral caruncles the method seems of value. In port-wine stains or birthmarks, or superficial angiomas, an injection in the upper layers of the derma of a weaker solution of quinine and urea hydrochloride enables one to substitue a white scar for the objectionable coloration of the vascular growth. The injection also seems to be very effective in the removal of warts and moles, a few drops of a thirty-three- to fifty-per-cent solution injected under the base of such a growth being followed by a rapid desiccation of the wart, which after a time drops off, leaving a reddened and transiently thickened scar. In a verruca of the hand which had recurred repeatedly after the application of trichloracetic acid, acid nitrate of mercury, and a solution of ethylate of sodium, this injection not only promptly destroyed the growth, but left a scar that was practically inconspicuous at the end of two months. In the removal of these small growths no

dressing is required, and the black eschar, if upon the hand, is not painful, and usually does not interfere with the vocation. Keratoses and superficial and deep epitheliomas of the skin or mucous membrane apparently may be likewise destroyed by the injection.

An ordinary syringe is employed, and for convenience a thirty-three-per-cent solution of quinine and urea hydrochloride is prepared in ampoules containing 2 Cc. each. With a fine needle the affected area is infiltrated, taking care not to infiltrate too widely. The chief action of the injection is to block the circulation and cause ischemia; therefore the entire area is infiltrated, or a proximal infiltration is so given as to cut off the blood supply. In treating sensitive areas the preliminary injection of a one-half of one-per-cent novocaine solution may be desirable to prevent the initial pain.

TRENCH-FOOT.

Frost (*Boston Medical and Surgical Journal*, March 1, 1917) notes that the symptoms of trench-foot vary somewhat in degree and order of onset, involving both feet usually, occasionally only one foot. After a period of duty in the trenches, varying from a few hours to several days, invariably soaked with cold water up to knees, or hips, the soldier feels that his feet are becoming numb and cold. He knocks them against whatever hard surface presents, to restore normal sensation. In a few hours they begin to swell. This may go on for three or four days. Gradually pain and tenderness develop, impeding walking or making it impossible. The pain assumes several forms: it may be a severe tingling or burning of the foot, most marked at the points of greatest pressure—heel and ball of foot; often it is of a rheumatic type, involving the toes and ankles when movement is attempted. Again, it may extend up the calves to knee and thigh muscles, tingling and pricking—neuritic in type. In these cases the calf muscles are generally tender. The pain is usually of the first two types, confined to the foot. In a lesser number of cases the first symptom may be pain of the types mentioned, followed by swelling and numbness; or the sensation of swelling, with final onset of pain. The rapidity of development of symptoms varies, doubtless according to the individual differences in circulation and resistance. For instance, one case had been in the trenches six days continuously when symptoms began, and on the twelfth day he was incapacitated. Another had been on duty only twenty-four hours when forced to withdraw. In the average case symptoms set in after three or four days' duty and incapacitate in twenty-four to forty-eight hours.

In clinical appearance there are several varieties of trench-foot, depending upon the degree of exposure. In the simplest type there is a discoloration of the skin, varying from a hyperemia to a dark-red or purple hue. Usually this is confined to the area where greatest pressure is exerted by the shoe; the head of the first metatarsal bone, the first and fifth metatarsophalangeal joints, the big toe, and the joints of the smaller toes. It may involve merely the depression at the base of the toes or extend over the dorsum and external borders of the foot, generally in such cases with some swelling. The sole of the foot is usually not involved. Anesthesia to touch and pinpoint and hyperesthesia, sometimes both, are observed; occasionally pain. The anesthesia is confined to the areas of discoloration and is very common in the toes, particularly the big toes. The hyperesthesia generally occurs in a small zone just outside the anesthetic area, though occasionally it may involve the whole dorsum. Pain is usually elicited by active or passive motions in the metatarsophalangeal joints.

Another type, characterized by somewhat more severe subjective symptoms, seems at first to be normal in appearance. There is no discoloration. In the first day or two there may be some edema; none after. The skin is rough and dry, rather more pale than normal. Hyperesthesia is apt to be general and acute, accompanied by numb-

ness of the toes. In these cases burning and tingling may be severe, accentuated to an unbearable degree by warm coverings, proximity to a fire, or even draughts of air. Severe pain is elicited by motion in the toe and ankle-joints.

In the longer exposed and more severe types, the chief features are the deep discoloration and edema, often accompanied by blebs and ulcerations. The discoloration is of a deep purple hue, involving in cases of only moderate edema the distal portion of the dorsum of the foot, but in the more pronounced cases extending over the back of the foot and toes, even involving the sole. The edema varies from a moderate puffiness of the dorsum to an extreme degree of swelling of the foot and ankle, with tense shining skin, occasionally extending upward upon the lower leg. Superficial blebs are often seen in these cases, developing at the points of pressure along the dorsum of foot and toes. If the discoloration is only moderate their contents are of a yellowish, serous nature, but in the more deeply cyanosed feet they contain a dark-red, often offensive, fluid. Ulcerations are likewise common at similar points, developing from ruptured blebs, easily infected and occasionally extending to such a depth as to expose the underlying bone. The toe-nails are often black, separating in course of time. In rare cases large blebs with offensive bloody contents may develop upon the backs and soles of the feet. These feet are very painful, preventing walking, tingling and burning to an extreme degree, especially at night and when exposed to heat. Rheumatic pains are felt in toes and ankles. Occasionally pain, pricking and constant, extends up the leg to the knee, even to the thigh. After all other symptoms have subsided this pain may persist. Tenderness of the calf muscles accompanies it. Anesthesia and hyperesthesia are also present: sometimes the one predominating, sometimes the other. In an anesthetic foot there is often a deep tenderness, elicited by firm pressure. One other feature is often noted in these more severe trench-feet—muscular paralysis. In the more pronounced cases the patient is unable to move the foot. Usually only the toes are affected, and the big toe is held in extreme dorsal flexion.

In these more severe types of trench-foot gangrene at times supervenes. As a rule it occurs at the areas of bony projection upon the dorsum of the foot—small, rounded, superficial islands of blackened slough; or upon the joints and tips of the toes, involving the nail. It is more often dry than moist. At times the first and second phalanges of the toes are involved. In the most severe cases, fortunately few in number, the whole foot is involved in a massive gangrene extending to the ankle. Cases of infection with gas bacillus and tetanus have been reported.

The treatment of trench-foot is simple, consisting of elevation, protection from heat, massage with oil and sedatives. With the feet raised upon pillows the greater part of the edema subsides in two to three days. In the majority of cases, with complicating hyperesthesia, coverings of any sort, exposure to heat, even slight currents of air, give rise to intolerable pricking and burning, most severe at night. Hence the feet are placed below a covered cradle, open at one end for coolness. In certain of the cases of generalized anesthesia, heat is well tolerated. As a rule the subjective symptoms are relieved by massage with olive oil. It must be gentle at first, becoming more energetic from day to day. Gradually the blood-vessels recover their tonicity, and the congestion and residual edema disappear. Applications of electricity seem to be beneficial. If the pain persists, various sedative applications may relieve it, such as a mixture in equal parts of the liniments of aconite, belladonna, and chloroform; or of acetate of lead and tincture of opium four ounces, one ounce in water to one pint. Occasionally the pain may be so persistent as to prevent sleep for several days. In such cases, morphine, codeine and other sedatives must be administered. Under this treatment, of the cases not complicated by gangrene, the simplest will recover in about two weeks, the average in three weeks, while the most severe may linger on from

five to seven weeks. In most of these cases, after getting up and attempting to walk, the feet will become congested and a little edematous, with no recurrence of symptoms. In a few days, with active exercise, the congestion and edema subside. The cases of gangrene are longer in recovery. As already mentioned, the gangrene is usually dry, in which case one waits until a line of demarcation has developed and excises or amputates. Certain of the cases of moist gangrene, particularly those involving much of the foot, present urgent and fulminating symptoms, requiring immediate amputation.

The prevention of trench-foot is a matter of some importance. It has been found impracticable to keep dry the front-line trenches in the low-lying districts during the rainy season. Various kinds of long water-proof boots have been considered, but are objectionable in that they impede the activity of the soldier by their weight and bulk. Frequent applications of oil have been found useful. The measure of greatest benefit seems to be a shorter period of duty in the trenches, with more frequent relief. During the first winter of this war the soldier was compelled, through lack of reserves, to stay in the trenches for much longer periods than during this past winter, with the result that trench-feet were much more common and of more severe type.

FASCIA TRANSPLANTATION INTO VISCERAL DEFECTS.

NEUHOF (*Surgery, Gynecology and Obstetrics,* April, 1917) under this title contributes a laboratory and clinical study which is summarized as follows:

The free transplantation of fascia into aseptic fields has a wide sphere of usefulness. It has proved very satisfactory in the replacement of thoracic defects, of aponeurotic defects in operations for various types of hernia, and of defects of the cranial dura. Fascia transplants have been very successfully used in a variety of ways, for the reëforcement or replacement of ligaments, tendons, and paralyzed muscles. They have proved effective as coverings for wounds of solid organs, especially the liver. Their usefulness has not been clearly demonstrated in other aseptic fields, as sheaths for the isolation of nerves, as strips for occlusion of the pylorus, in fixation or suspension of organs, for separation of joint surfaces.

There are many advantages of fascia over other tissue transplants (fat, muscle, periosteum, etc.) for the purposes mentioned. Fascia (lata) is most readily accessible, is obtainable in almost unlimited quantities, and its removal does no damage. Transplanted fascia has a remarkable tendency to heal in place even under most disadvantageous conditions, requiring minimal nourishment to obviate necrosis. It combines great tensile strength with slight tendency to stretch or to contract. It is most readily adaptable to the shape of any organ and, technically, can be most easily handled. Finally, fascia can be invariably transplanted autoplastically. The other transplantable tissues have some of these characteristics, none of them has all. The ultimate fate of transplanted fascia has not been definitely determined. The experiments reported indicate early disintegration in non-aseptic fields, degeneration at later periods in aseptic fields. Of practical importance is the fact that the resultant firm connective tissue is as serviceable as the original transplant.

These striking qualities led to attempt to employ fascia transplants in non-aseptic fields; in the presence of infection, or about hollow viscera. A few successes and about an equal number of failures followed. The use of fascia for such purposes was deemed undesirable, the successful results having been considered fortunate accidents.

Experimentally, fascia transplants have been found satisfactory for the reënforcement of suture-lines in hollow viscera. They were successfully employed in a few instances to bridge small tracheal fistulæ, and they occasionally prevented leakage from small esophageal and bladder fistulæ. These occasional satisfactory results were found to depend upon healing by contraction of the defect. For this reason failure followed

every experimental effort to replace appreciable esophageal and vesical defects.

The technique employed in these experiments on hollow viscera (and on other organs) was the attachment of the transplant over the defect. To offer any chances for uniform success a method was evidently required to prevent the cut margin of the organ from rolling back, to give sutures a firmer hold on the organ by passing them through all its layers, to more readily supply the graft with provisional nourishment, and to invite the overgrowth of the lining mucous membrane of the organ. It is demonstrated that these requirements were met satisfactorily by suturing fascial sheets into instead of over defects of hollow viscera (and of other organs). With this technique the following results were obtained:

Large vesical defects (up to about one-half the bladder-wall) were replaced by fascia with uniform success. The functional and anatomic results were excellent. They were attained by the upbuilding of a new bladder wall. Epithelial overgrowth at the site of the defect was complete at an early stage. The newly formed bladder wall was as thick as or thicker than the remainder, and equally or more resistant to pressure from within. This was probably due in part to the fact that bone appeared invariably at the site of the defect, definitely limited to that area. The osseous tissues appeared remarkably soon after operation, reaching the height of their development in the second or third month. In conjunction with the bone there was formed typical bone-marrow (and cartilage, in one experiment) and an ensheathing, periosteum-like layer of connective tissue. That the transplanted fascia as such was not responsible for the formation of bone was demonstrated by the development of osseous tissue when fat was used to bridge vesical defects. The formation of bone and related tissues was explained by the theory of connective-tissue metaplasia, the assumption being that calcium salts, derived from the urine, were the centers of stimulation.

Another uniform feature was the presence of smooth muscle in the connective tissue occupying the defect. It was continuous with the muscle of the bladder wall. Its presence was accounted for on the basis of smooth muscle regeneration.

The immediate anatomic and functional results of replacement of extensive ureteral defects by tubes of fascia were satisfactory. Ultimate results could not be ascertained, for reasons that have been stated.

Large tracheal defects (involving as much as three cartilage rings and most of the anterior aspect of the organ) were invariably replaced successfully. The anatomic result was ideal, ciliated tracheal epithelium growing completely over the transplant soon after operation. The functional results were satisfactory, the newly formed tracheal wall being rigid and resistant, the narrowing of the tracheal lumen being insignificant.

Large esophageal defects were replaced successfully in all experiments. Slight stenosis developed soon after transplantation; at later stages this was almost imperceptible. Epithelial overgrowth was complete. The functional was as good as the anatomic result.

Perforation through the transplant invariably followed its simple implantation into gastric defects. On the other hand, smooth healing always occurred, even with very large defects, when gastroenterostomy, with or without pyloric exclusion, was added. This striking contrast demonstrates the profound influence of gastroenterostomy upon healing of gastric lesions near the pylorus. Healing was firm and complete, gastric mucous membrane completely overgrowing the site of the defect. In one instance bone formation in the scar tissue was observed. Its development was explained on a basis similar to that suggested in the group of bladder experiments.

Fascia transplantation into small defects in the upper part of the small intestine was occasionally successful, succeeded more often in the lower part of the small intestine, and was most successful in the large intestine. In the latter, larger defects could often be satisfactorily replaced. Healing

took place by the upbuilding of new tissue and partial epithelial overgrowth, as well as by some contraction of the defect.

The following results were obtained in transplanting fascia into defects of organs other than the hollow viscera:

The (altered) transplant became firmly and permanently adherent to large defects made in the liver. Previous experiments had only demonstrated good immediate results, whereas, for stated reasons, the determination of the more distant outcome was considered of importance.

Large defects of the diaphragm were satisfactorily replaced by fascia. The (altered) transplant healed firmly in place, permanently preventing the development of hernia or eventration. Its surfaces were completely overgrown by parietal pleura and peritoneum respectively. Previous experiments had not demonstrated this mesothelial overgrowth. They dealt with immediate results, which were good functionally, indifferent anatomically.

Large pleural defects were satisfactorily replaced by fascia. The final results were good anatomically and functionally. Overgrowth of pleural mesothelium was complete except where the lung was adherent. Adhesions were not encountered in some previously reported experiments.

Good immediate results were obtained in transplanting fascia over large defects of the lung. The firm union prevented leakage of air; the free surface of the transplant was smooth and non-adherent. Final results could not be ascertained, owing to the development of pleural effusions.

The immediate functional and anatomic results of transplanting fascia into large defects of the pericardium were good. Final results could not be ascertained, owing to the development of pleural effusions.

Large defects of the spinal dura were satisfactorily replaced by fascia. Adhesions between the incised underlying cord and the (altered) transplant did not develop. Previous experiments and operations dealt with defects of the cranial dura; adhesions between the transplant and the unoperated brain were encountered.

The clinical aspects are discussed in each of these groups of experiments. In addition, two clinical reports on fascia transplantation into defects of hollow viscera are appended. In one it is demonstrated for the first time that a large urethral defect can be very satisfactorily and very simply replaced by fascia. A similar demonstration is made in a large tracheal defect; this is the second case recorded in which fascia has been transplanted into a tracheal defect.

THE EFFECTS OF HIGH EXPLOSIVES ON THE EAR.

WILSON (*British Medical Journal*, March 17, 1917) concludes an interesting article on this subject as follows:

The normal stimulus (musical notes or voice) is an adequate stimulus for the nerve and is the best stimulus. Electricity is contraindicated and likely to do harm, since it so easily produces vertigo.

In the totally deaf, bone conduction is perceived before air conduction. It is essential to differentiate vibrations from musical notes.

In those cases summation of stimuli plays an important part in the perception of sound.

There is a marked diminution of the duration of hearing along the whole series of forks, both through bone and air. This corresponds and exists *pari passu* with concentric limitation of the fields of vision. Often both improve together. Frequently the field of vision is more retracted on the side having the greater deficiency of hearing.

If the conducting mechanism is damaged or destroyed it not only takes longer to get improvement, but complete recovery cannot be expected.

Prognosis is good as a rule, especially in cases in which there is no trauma demonstrable in the peripheral organ, no history of aural vertigo, and a normal caloric reaction. The most noteworthy exception met with so far is damage to the seventh nerve. In these cases hearing returns but slowly, and so far as observed not perfectly, even

with a normal drum membrane, little if any signs of middle-ear inflammation, and a caloric reaction present.

As a result of the concussion due to explosives there is frequently a trauma demonstrable in the ear. This may be accompanied by neurosis (traumatic neurosis), especially headaches and vertigo. The perception of sound is diminished over the whole normal range; the diminution may be so great as totally to abolish perception of sound. The author has not seen a case yet associated with tone islands. What he does find is a diminution all along the scale both for bone and air conduction.

As the deafness diminishes there may persist for a long time an inability to grasp intelligently what is said or to retain the memory of it. Thus a word may have to be repeated two or three times before the patient gets it; or, if he be asked to repeat two or three numbers given consecutively, he will repeat the last one; he knows that there were others, but did not get them.

ECTOPIC PREGNANCY.

OASTLER (*Surgery, Gynecology and Obstetrics*, February, 1917) records 100 cases of ectopic pregnancy. The pathological conditions found led him to conclude that ectopic pregnancy occurs about as often on one side as the other. If previous inflammatory condition of the tubes were the sole cause, we would expect the condition to be more prevalent on the left side.

That the pregnancy is located about as frequently in the inner half of the tube as the outer; that interstitial and ovarian pregnancies are of rare occurrence.

That tubal abortion is the variety of rupture most commonly found, whereas of the other varieties erosion of the tube is very much more common than rupture from overdistention. Severe hemorrhage may occur from tubal abortion and erosion of the tube. It is uncommon for the ovarian artery to be eroded. Rupture into the broad ligament is conspicuous by its absence.

That double ectopic pregnancy is very common; that ectopic may be associated with normal pregnancy; that interstitial ectopic may push its way into the uterus and continue to grow; that it is possible for ectopic pregnancy to occur twice on the same side.

That the termination of ectopic pregnancy usually occurs in about six weeks, pregnancies later than three months being uncommon.

That most ectopic pregnancies die (*a*) and are discharged into the abdominal cavity and absorbed; (*b*) they become a tubal mole and are absorbed; (*c*) the fetus disintegrates and forms an abscess in the abdominal cavity.

As to the symptomatology, a review of the facts leads to the following: Ectopic pregnancy is for the most part rather a subacute disease, a disease in which the symptoms continue with one or more exacerbations for one or more weeks, the patient gradually becoming weaker and weaker until relieved by operation or death of the pregnancy. The so-called acute cases, violent cases, are very much in the minority. Therefore we must think of ectopic pregnancy as a disease comparable to a more or less severe type of salpingitis, many of the symptoms of which it has.

The pain of ectopic pregnancy is of importance, very much like the cramps of intestinal colic; it is often taken for such. Not all cases have pain of a cramp-like character, however. Very often associated with these cramps is a feeling of faintness, vomiting, chilly sensations, and constipation, misleading the physician in the direction of intestinal disturbance.

The classic feature of a skipped period is absent in a majority of cases. This fact is of importance as a warning not to place too much faith in the symptom as a necessary concomitant of the symptom-complex of ectopic pregnancy. One feature of the menstrual epoch is present with considerable regularity—irregular spotting or severe bleeding continuous with menstruation or during the intermenstrual period. The color or the consistence of the blood is of no diagnostic value. Irregular bleeding so

often accompanies adnexal inflammation, however, that it is in itself not diagnostic.

Ectopic pregnancy is not a disease of normal temperature. Some temperature is present in almost every case, with a range between 99.5° F. and 100.5° F.

Pulse-rate and blood-pressure are of little diagnostic importance except in those cases in which the frequency of the pulse is out of proportion to the temperature.

The blood picture is not satisfactory. Leucocytosis is present in a large proportion of the cases, and a low red count is generally accompanied by a high white, but this does not occur regularly and the results are often confused.

The presence of albumin and casts in the urine in a large percentage of cases is significant.

Irritation of bladder and rectum is much more common than is generally supposed.

The physical examination, abdominal and bimanual, reveals the usual signs of peritoneal irritation, tenderness, distention, and rigidity—more or less pronounced; and the bimanual examination often discloses a mass in the pelvis. These symptoms, however, are present in salpingitis. There are certain symptoms, nevertheless, which seem to be of special value: (1) exquisite tenderness out of proportion to other local symptoms; (2) the situation of the uterus in the normal position, movable and not in retroposition fixed; (3) the boggy sensation to the mass in some cases; (4) the enlarged uterus and soft cervix; (5) rarely the blue vagina. In many patients, however, there is nothing but exquisite localized tenderness to guide us in our diagnosis.

The analysis of 106 cases of tubal pregnancy leads to the conclusion that there is no one diagnostic symptom peculiar to the condition. The symptom-complex, however, if complete, affords an easy diagnosis. If the patient, who has had previous pelvic trouble and has passed two weeks over her period, is suddenly seized with cramps in the lower abdomen which are localized to one side, if the patient begins to flow, feels weak and vomits, if she has a temperature of about 100° F. with pulse of 120, and she goes to bed and after a few hours is relieved, and in two or three days is able to be up and around, only to have the attacks repeated, once or perhaps several times, and if examination reveals a pale woman, with some local distention and rigidity of the abdomen with peculiar exquisite tenderness to one side of the uterus on bimanual examination, the presence of a boggy or elastic mass, the uterus enlarged and in position, the cervix soft, vagina blue, then the diagnosis should be made without any difficulty. Unfortunately, these symptoms are not often assembled in such a satisfactory manner, and the diagnosis is then very difficult. Only too often the uterus is curetted for a supposed abortion or the patient is treated for salpingitis or appendicitis.

There should be no difficulty in diagnosing the acute variety of ectopic pregnancy. Out of 106 cases, 6 were diagnosed before rupture, 70 after; in 30 the diagnosis was improperly made.

Out of 106 cases, seven died. Five belonged to the acute type, one died while being prepared for operation, two without operation, three following operation and one suddenly thirteen days following operation, in apparently good health, from pulmonary embolism. The mortality is therefore low, and with proper care the patients generally recover.

Of this series of cases all, with but four exceptions, were operated on as soon as the diagnosis was made. Of the four cases excepted, two were in such acute shock from loss of blood that it was deemed advisable to wait in the hope that the patients might react from the initial shock; the other two died before the abdomen was opened.

The conclusions reached from observation of these cases would seem to be that all subacute ectopic pregnancies should be operated on at once, removing from the abdomen the tube affected, the fetus, placenta, membranes, and blood. All acute cases should be operated on at once except cases *in extremis*. In these cases it would seem advisable to wait, watching the patient

very carefully. If no improvement occurs in a very short time, operate. Two cases of this series bled to death; the ovarian artery had ruptured in both. One was an interstitial pregnancy. As there is no doubt, therefore, that patients can bleed to death, operation must not be delayed too long in waiting for a reaction in these extreme cases. The abdominal route was chosen in all these cases, and it is undoubtedly the only safe procedure to follow.

SIMPLIFIED SURGICAL TONSILLECTOMY.

HAYDEN (*Chicago Medical Recorder*, April, 1917) always employs ether as a general anesthetic. As a local one adrenalin chloride, 1 drop to the ounce of 1-per-cent solution of novocaine, or 1/10 of 1 per cent of cocaine, is used. Two injections are made into the anterior pillar, one high, and two through the tonsil tissue just beyond the capsule, between it and the superior constrictor of the pharynx, one high up and the other low down. The injection should be made into the mucous membrane, but not through it, and in such a way that blebs will appear on its surface. In this way almost a complete anesthesia and a very satisfactory degree of ischemia are readily obtained. All children under eight years of age should be narcotized. More than half the author's adult cases have been done under local anesthesia. All patients get a small dose of atropine hypodermically thirty minutes before going to the operating-room to lessen the salivary secretions.

In general anesthesia the patient lies flat on the back. If operations are done under local injections, the patient is seated in a chair, a nurse steadying the head from behind.

The right tonsil is removed first. It is firmly grasped by the volsellum forceps near its upper and lower poles and drawn straight forward and up toward the median line. In this way it outlines itself clearly underneath the anterior pillar. The anterior pillar knife is then introduced under the edge of the pillar at the superior pole, where it readily finds the line of cleavage between the tonsil capsule and pillar. It passes from above downward, always in plain view, underneath the pillar toward the inferior pole. Here the point is turned directly inward toward the tongue, so that the part of the pillar which is attached to the lower jaw and base of the tongue remains intact. The glistening white anterior surface of the tonsil is now readily exposed by pushing the freed anterior pillar back with the blunt convex surface of the knife. The posterior pillar knife is now passed over the superior pole of the tonsil into the superior tonsillar space, and back into the line of cleavage between the posterior pillar and the tonsil capsule. It is then carried downward until the posterior surface of the gland is entirely free. The superior pole is now tilted inward toward the base of the tongue on the volsellum so far as the attachments of its neck surface to the fossa will allow. These attachments are kneaded away by the convex blunt surface of the posterior pillar knife well down toward the inferior pole.

The snare loop is now slipped over the forceps and made to encircle the remaining attachment of the gland to the lower part of the fossa, including the plica triangularis. Considerable care should be taken to keep the wire snugly against the tonsil base behind, with the slack of the loop in front. In this way the uvula is never in danger. The tonsil is removed by slow ecraseur.

The tonsil fossæ of every tonsillectomy case should be dry when the patient is returned to bed. To allow a severed vessel to go untied is universally admitted to be bad surgery anywhere except in the throat. Here hemostasis has been left almost entirely in the hands of fate. Just why this should be so is not apparent, especially when bleeding can be controlled with the same ease and precision as in any other part of the body. To do this the anterior pillar must be drawn forward as soon as the tonsil has been removed, and the entire fossa explored for bleeding points. As all

of the vessels that enter the tonsils are of microscopic size, it follows that there can be no generalized oozing of blood in this locality, the frequent allusions to and the descriptions of the same to the contrary notwithstanding. Very frequently a vessel is found lying bare in the fossa a quarter of an inch or more. If its lumen is pointed against the smooth wall of the fossa it can very easily give the appearance of an indefinite general oozing, in much the same way that water coming out of a garden hose, whose end is being held directly against the ground, seems to well up all over instead of spurting from one particular spot. On close examination, however, blood will be found to issue from a definite point. This should be caught immediately with a suitable artery clamp, while the other tonsil is being removed. Or, if the bleeding occurs in connection with the second tonsil, the hemostat should remain attached for a minute or so. If the bleeding still continues when it is removed, or if it was particularly active to begin with, or if for any extraneous reason, such as high blood-pressure, slow clotting, etc., troublesome hemorrhage is to be expected, the pillars should be immediately sutured.

The soft palate is drawn forward, the threaded needle is introduced behind the posterior pillar opposite the bleeding point, and passed deeply through it and on, superficially, beneath the floor of the tonsil fossa toward the anterior pillar. Here the needle must stop, otherwise the tissues through which it is passed because of their extreme friability will be torn. The pillar pusher now is slid down along the shaft of the needle, whose point will always come into the V-shaped opening if the two instruments are kept parallel to each other. The pusher works the point through the anterior pillar until the eye carrying the silkworm-gut comes into view. The suture hook at the other end of the pillar pulls the thread forward, while the eye itself slips back over the distal end of the silkworm, along the same path by which it entered. A double knot is tied. If the stitch has been taken in the right location there will be no further bleeding. A second one is, however, occasionally required. By using the first as a palate tractor the needle very readily passes through the approximated pillars in any location, and to any depth that is desired. In one or two cases when the stitch has failed to catch the floor of the fossa a ballooning of the pillar occurred, with the formation of a hematoma underneath. This fact is mentioned to emphasize the importance of including the floor of the fossa with the pillars in the suture.

The suture is cut out at the end of twenty-four hours by a straight, blunt-pointed scissors introduced between the pillar margins. The closed scissors are then passed from the superior tonsillar space down toward the base of the tonsil fossa, and the slightly agglutinated pillar surfaces, when thus separated, readily fall into their natural positions. Scarcely a mark can be seen to indicate the former location of the stitch. There is no edema except when both sides have been sutured. With the exception of a slight sensation of tightness in the throat, the patient is entirely comfortable while the suture remains *in situ*.

RETROVERSION OF THE UTERUS: ITS ETIOLOGY AND RATIONAL TREATMENT.

WILLIAMS (*Boston Medical and Surgical Journal*, April 19, 1917) after a discussion of five of the most popular methods of treatment of this condition concludes his excellent study of the subject as follows:

Retroversions of the uterus may be divided into three classes:

(*a*) Inflammatory, in which the uterus is displaced by a pus mass and the fundus afterward drawn backward by adhesions.

(*b*) Congenital, in which the retroversion may be said to be the normal position of the uterus for that individual.

(*c*) Acquired, as the result of injury or relaxation consequent upon childbirth in which the retroversion is not a condition *per se*, but a part of the general process of prolapse.

In retroversion of the first class, treat-

ment is directed primarily to the inflammatory process and the displacement is corrected only incidentally.

Congenital retroversions are usually symptomless and require no treatment.

Retroversions acquired as the result of parturition should be considered as a step in prolapse of the uterus and the downward as well as the backward displacement corrected.

Retroversion is an infrequent cause of sterility in itself.

Retroversion may cause miscarriage if the uterus becomes incarcerated, but most retroversions are corrected spontaneously during the early months of pregnancy.

A retroverted uterus discovered on postpartum examination, if obviously congenital in type, needs no treatment. If of the acquired type, the malposition should be corrected and treatment by pessary instituted, deferring operation if possible until the patient has passed the child-bearing period.

REVIEWS.

A HANDBOOK OF PRACTICAL TREATMENT. By Many Writers. Edited by John H. Musser, M.D., and Thomas C. Kelly. W. B. Saunders Company, Philadelphia and London, 1917.

This fourth volume of the Handbook of Practical Treatment has been brought out with the idea of giving the various original contributors the opportunity of making in their articles such changes or modifications as are indicated by the progress of therapeutic knowledge. Moreover additional articles have been written by new contributors who have become known through their valuable contributions to medical science, such, for instance, as the Treatment of Cerebrospinal Syphilis by Swift; Hay Fever, by Goodale; Acidosis, by Howland and Marriott; Occupation Diseases, by Gilman Thompson; The Governmental Prophylaxis of Disease, by Samuel G. Dixon; Specific Therapy of Dental Suppuration, by Smith and Barrett; Splenectomy as a Procedure in the Anemias, by Krumbhaar and Pearce; Specific Principle of Pneumococcus Infections, by A. R. Dochez; Postural Treatment of Abdominal and Visceral Disturbances, by Goldthwait; Diseases and Surgical Treatment of the Spinal Cord, by Elsberg.

In the supplementary volume will be found all the newer methods of treatment that have been shown to be efficacious in the handling of disease. Nor is this statement controverted by a review of the work. Thus Blumer gives an extremely brief and very lucid résumé of Food Intoxications, including the avitaminoses, to wit, Beriberi, Pellagra, and Scurvy. Pancoast's section on Roentgen Therapy is especially commendable. Otis in his section on Tuberculosis gives an extremely satisfactory description of the Technic of Artificial Pneumothorax. Ashford briefly but comprehensively summarizes recent knowledge bearing upon Tropical Diseases. As a repellent to mosquitoes he advises the following mixture: 1 part oil of bergamot; 10 parts of kerosene or citronella oil; 6 parts of vaselin. Attention is called to the fact that all malarial attacks seem to be marked by Urobilinuria. De Schweinitz has written on the Ocular Complications of the Infective Diseases in his usual terse and lucid style. Hall's section on Animal Parasites is a summation of recent knowledge concerning this subject. It is worthy of note that such practical subjects as the Starvation Treatment of Diabetes, Treatment of Acidosis in Children, Diabetes, Gout, etc., are considered from the essentially modern standpoint.

There are few books the surgeon, the physician, or the specialist could attentively read from cover to cover from which he might obtain as much instruction bearing directly upon his daily work and making him more efficient in his particular line. The editors deserve high praise for having so skilfully balanced to a symmetrical whole the work of many distinguished authors.

NOTES AND QUERIES.

FIGHTING DOCTORS.

The *British Medical Journal* of May 19, 1917, gives this interesting historical note appropriate to these times:

In an account of a cutting-out operation by gunboats the commander of the expedition was said to have asked for a "fighting doctor" to be sent to him. The doctor, whose proper function is the saving of life, is not generally expected to handle weapons of destruction, but there have been instances in which he has been carried away by the fighting spirit in the excitement of battle. Many years ago we knew an old army surgeon who at Waterloo threw away his bandages and tourniquets and took part in the famous charge of the Scots Greys, holding on to the stirrûp of a horseman. According to Kinglake, the Duke of Cambridge in the Crimea on two occasions owed delivery from a position of embarrassment to army surgeons. When the Guards were hard pressed at Inkerman, the Duke went in search of reënforcements, and a remnant of the regiment had to be brought out through a heavy Russian column by Dr. Wolseley, who was, we believe, a brother of Lord Wolseley. The Duke was rescued a second time in the same action by the pluck of another doctor. Dr. Wilson was attached to the brigade of Guards as a volunteer assistant surgeon from the 7th Hussars. At a most critical moment of the battle he got the Duke of Cambridge out of a position of extreme danger. For this service he received the thanks of the Duke at the head of the brigade after the battle. Sir Anthony Home won the V. C. during the siege of Lucknow "for persevering bravery and admirable conduct in charge of the wounded men left behind the column, when the troops under the late Major-General Havelock forced their way into the Residency of Lucknow, on the 26th of September, 1857." The details are given in the *London Gazette* of June 18, 1858: "The escort left with the wounded had, by casualties, been reduced to a few stragglers, and being entirely separated from the column, this small party with the wounded were forced into a house, in which they defended themselves till it was set on fire. They then retreated to a shed a few yards from it, and in this place continued to defend themselves for more than twenty-two hours, till relieved. At last only six men and Mr. Home remained to fire. Of four officers who were with the party, one was badly wounded and three dead. The conduct of the defense during the latter part of the time devolved therefore on Mr. Home, and to his active exertions previous to being forced into the house, and his conduct throughout, the safety of any of the wounded, and the successful defense, is mainly attributed." Dr. Ryan, author of "Under the Red Crescent," took an active part in leading Turkish troops at Plevna.

But fighting doctors have usually shown their warlike spirit defending their patients. In the Paris revolution of 1832, when the crowd threatened to attack the Invalides, Larrey took up a position at the main entrance and told the attackers they would have to pass over his dead body to get at his patients. Lieutenant-Colonel J. H. Reynolds won the V. C. by his active defense of the wounded under his care at Rorke's Drift. A correspondent of the *Cronique Médicale* gives some other instances. In a French retreat in one of Dumouriez's campaigns during the wars of the Republic, the serious cases could not be removed from the hospital at Aix-la-Chapelle, and Surgeon-Major Bavay alone remained at his post. After the evacuation of the town by the French the populace attacked the hospital. Bavay distributed guns among the orderlies, barricaded the doors, and held back the assailants. In another battle Surgeon-Major Martin when the French retired placed his wounded men in wagons, marched in the rear of the convoy, and foot by foot disputed the ground with the enemy. At the evacuation of Lisbon the surgeon-in-chief, Jean Béguerie, pistol in hand, defended his patients against the insurgents.